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### DELAYED INFECTION OR IRRITATION AND CONCOMITANT METABOLIC ERRORS.

By WILLIAM A. LURIE, M.D., NEW ORLEANS, LA.

[From the Clinical Department, Charity Hospital.]

THE title of this paper may seem unique. The idea of infection, its various sources and course, as well as its eradication and subsequent metabolic disturbance, seem sufficient. As delayed infection, new possibilities are unfolded in so far as recognition and treatment of metabolic or functional changes are concerned.

The consideration of delayed infection as an ever potent factor, possible of alteration of body metabolism, is what that title is intended to convey, as in contra-distinction to the ideas of focal infection. The determination of an error of metabolism should be early recognized and corrected so that by the eradication of recognized points of infection or irritation more serious errors of metabolism may be avoided. Points of infection or irritation are sought for and discovered only at the time of a serious breakdown, even though long existent. By the discovery of some delayed infection it is more often possible to recognize early metabolic errors and forestall later break-downs, rather

than to allow an infection or irritation to proceed to the gravity of a definite and defined focus.

It is first necessary, in the recognition of these conditions, to understand what influence upon the organism may be looked for, before the stage at which a defined focus may be recognized. What constitutes a healthy organism and what deviations from health are possible, is therefore a question necessary of early determination.

The most simple and perhaps true definition of what constitutes health may be found in the statement that health is perfect coördination of an organism. Explained in detail, it means that the function of the various organs comprising that organism are perfect and that the energy consequent of such perfect function can be and is properly utilized and disposed of. Should this precept be altered in the least, in any direction, health, that is perfect health, will be deviated from. Health means that there will be no store-house established anywhere in the body to store excess energy; it means that no more energy is produced than is needed and that all that is required is at all times produced. The failure of production of one form of energy, or the over production of some other, is a deviation from health, and should be recognized as such.

However careful the laboratory studies on body mechanism or however careful and simple and correct these experiments and their deductions have been, the incident of "personal equation," so called, has only been mentioned.

To quote Zinsser:—"Every infectious disease is the result of a struggle between two variable factors—the pathogenic powers of the bacteria on the one hand, and the resistance of the subject on the other,—each of these again modified by variations in the condition under which the struggle takes place."

It is a well known fact that nature is ever attempting to rebuild lost parts; to repair is the law of nature. Nature is not destructive and the action of any organ of the complex organism such as a human body is, is not directed to the breaking down of the organism as a whole but to the rebuilding and the reconstruction of such parts as are destroyed by cell function and cell activity. It is only when cell activity has been so over stimulated that the ratio of its ferment production is too abnormal, that such cell activity and ferment production or rather over production becomes a vicious product capable of destructive changes.

In the harmonious action of such a harmonious whole, as body health is, each individual organ bears a relation to all of the others, no matter how infinitesimal such action may appear on a hasty study or survey. The sudden call to activity of a dormant part or organ influences every cell of the entire organism. The call for increased nourishment on account of increased or renewed activity of a part is the first change we have learned to recognize. We cannot deny that a sudden call for nourishment at one point, will cause a temporary lack of nourishment elsewhere. As a whole the body mechanism soon becomes readjusted and adapts itself to such sudden calls.

It is known that the influence of infection, or even gastric digestion, may be recognized within a short space of time throughout the entire body. The element of time, the rate of activity as well as the rapidity of introduction,—each plays an important rôle. Thus the "concentration and velocity of reaction" of body ferments may be applied to individual cell function and to various organs such as the ductless glands, etc. Each is influenced by a sudden call to action by either normal functional stimuli or some abnormal stimulation, which may be an effort at

body protection. The ductless glands can and do react to a variety of stimuli and they are influenced by "conditions under which the struggle takes place." They are as certainly influenced by a mild, but nevertheless protracted stimulation as by sudden concentrated attacks. The alteration in one gland or set of glands will eventually cause an alteration in another set or all other ductless glands or ferment producing cells.

Referring to Zinsser again and his law of immunity, which is that "immunity and resistance vary in direct proportion," we find again a correlation between existing invasion and protection against invasions.

As the mighty armies of men just returned from the recent war have demonstrated that a fortress or battle sector is secure only in proportion to the resistance that can be utilized to overcome the force displayed by the attackers, and that a weakening or loss at one point in battle has its effect distributed over the entire front, in morale as well as battle strength; so infection or a pathological invasion or the vicious or even normal variation in the activity of a group of cells has its influence on the entire mechanism and on each integral part of that organism; not alone as the individual influence of the infecting organism, but also a deleterious effect due to altered function and action of enzymes. By certain actions there is produced an over functioning of some, while from others there may be a hyposecretion.

The constant alteration in normal body equilibrium, active over a long period of time, is productive of a lower resistance or vitality, making possible the definition of a focus of infection or irritation which in reality may have been long present, but dormant or delayed.

By the defining of the infection as delayed, an attempt is made to picture what change is taking place in an organism during such time of infection or irritation. In the acute stage there is a sudden call made upon the forces for protection. If the vitality is sufficient, such a process is overcome and a wall of protection is formed about it. There is no denying that at such a time all the resources of the body have been called upon and have donated their share in the battle. If such an infection is overcome, but not healed, there remains a constant call upon the body to continue the protection which it had started. What is the effect of such a

continued irritation? It is in reality a delaying of a subsequent infection,—a delayed infection.

Following the healing of such conditions, there may be an apparent return to health, until some other, often acute, infection or contagion takes place and following it: recovery does not take place. Some metabolic disturbance is noted. The correction of it is impossible until the old focus is re-examined, and in it is again found an active infection. This is in keeping with the teachings of Duke on double infections and the cure of the lesser to heal the greater.

Special protection is afforded by the action of specific organs. In the over functioning of these organs in their efforts at protection they require a greater supply of nourishment. Their capacity of ferment storage and reserve is increased. They enlarge. Organs not so vital in the prevailing battle suffer through a lack of function and nourishment. In this manner the whole organism becomes upset. The body forces are maintained and functionate to the prevention of a definite invasion. With the advent of a second infection or irritation, the resources are again called on and the heavily burdened protective ferments are overtaxed. The line of reserve is weakened. What was reserve for the protection against an existing infection is utilized. The replacement of such reserve becomes a burden. An infection which lay dormant by virtue of such forces of body protection begins its advance throughout the body. At such a stage it is recognized as a focus of infection.

Perhaps the various points I have attempted to make are more or less conceded, but their rehearsal is not amiss as introduction to my subject. I shall attempt to draw the same analogies between infections and irritations and the serious effect on metabolism and the serious errors of metabolism which are found incident to such infections. I am choosing the jaws as the sight of such delayed infection. I know I have selected a popular area, both by point of choice of infection and also from the point of frequency of occurrence.

Infection about the jaws and teeth is a conceded point. Their pathogenicity is also conceded. Roentgenographically, much of such infection can be portrayed. Truthfully there is more often more portrayed than is recognized or even looked for.

It is taken for granted that a tooth socket heals after extraction of the tooth, and that the infection heals or the irritation is obliterated.

Such areas do not always heal.

It is possible to demonstrate on properly taken roentgenographic films that where an infection was located in the jaw about a tooth as far back as twenty years before, at which time that infected member was extracted, that such an area may be still unhealed. On operation, that fact can be demonstrated; and in the majority of instances active, though attenuated culture of bacteria can be grown. Little consideration is given the absorption of alveolar process, following extraction of teeth, but such absorption is a toxic process.

The changes in metabolism, the results of an attempt by nature to rid itself of the irritation of such areas, are not inconsequential. The fight against infection proceeds continuously. The resultant alteration in function, activity, and rate of production of various enzymes is likewise continuous. Where there is a great change in the rapidity of enzyme production there is a corresponding fluctuation in the concentration of such enzymes. The greater the amount and the greater the velocity of production of enzymes, the less their concentration.

The subject which concerns us is not alone the diagnosis of such conditions, but the attempt to fathom, if possible, their relation, if any, to subsequent metabolic changes. It is the continuation of such processes that give the subject to this paper.

Osborne states that "the number of serious things throughout the body that are associated with these mouth infections is simply astounding."

Their association is admitted on all sides. Their gravity is also admitted, their treatment conceded. Such alterations as do take place during healing are not recognized as metabolic changes incident to an infection or even considered as possible errors of metabolism.

Serious metabolic errors are found associated with old unhealed processes of a variety of natures, but most constantly and in appalling proportions, associated with mouth conditions. The simple healing over of the socket of an extracted tooth seems innocent enough. Little concern is given the physiological disturbance occasioned by the absorption of useless alveolar process. The pathology of the absorption of such bone

structure has been little studied, likewise the pathology of the absorption of toxic matter from about a devitalized tooth.

"The animal disposes normally over a defective mechanism of considerable efficiency."—Zinsser.

What is taking place during such a defensive battle must be considered; the disposition of the foe and the effect upon the presence of a subdued but not disposed of foe must also be seriously thought of.

In the cases here outlined the connection between the process termed "delayed infection" and the condition of the patient will be apparent.

CASE 1. Miss L. L., dancing teacher, 40 years old, applied for examination and treatment in October of 1917. History of the case as follows: Has had "humbago" of varying severity for the past six years. Has noticed that pain at times has ascended to the neck and back of head. In the past two years has been conscious of head noises and at times a dizziness which prevented her dancing. Has been under constant care of dentist, and medico-dentally the mouth was in good condition, but at times patient complained of soreness in the gums. Roentgenograms of the jaws and teeth disclosed several small areas of dental caries between some of the molars and under the gingival margins, and a devitalized upper left lateral tooth on which there was a porcelain crown with a pin in the root. At the apex of the root there was an area of rarefaction visible, and within this area, some foreign matter of about metallic opacity. The specific history of this tooth was as follows: When about 18 years old a gold filling was put in this tooth. By accident the filling was knocked out and the tooth broken about 6 years later. When she was 26, for cosmetic effect, the tooth was ground off and a crown attached. Two years later a large "gum boil" formed which was opened. This abscess never healed. A year later, it was injected with bismuth paste, after which it apparently gave no further local trouble. This patient was quickly and entirely relieved by the removal of the root in question and the proper surgical operation performed to remove the foreign material and obliteration of the dead space. Her mouth was further cared for by a dentist, who made suitable repairs and filled the cari-

ties, as was disclosed by the roentgenograms.

In further analysis of this case we find it one which is more prone to be treated for the symptoms it displays, as "humbago, vertigo," etc., rather than by the removal of the existing cause of a serious metabolic error. As a young and vigorous woman, active as she must have been to undertake to teach dancing, she was able to withstand a greater assault of infection. Her system, in strength, walled off the process by a circumscribed abscess. The effect, however, of the continuous battle against an invading host began to tell after 14 years. She developed symptoms of improper metabolism. Her powers of reorganization were overtaxed by the constant and slowly losing fight against invasion. Gland products, which were used for protection, were called and utilized elsewhere. Once she was relieved for the necessary application of energy to such a battle, her metabolic balance was reestablished. Her symptoms disappeared.

CASE 2. Mr. J. R. P., plumber, age 44 years. Applied to me for treatment in the spring of 1917. Has had backache for a number of years; exact number not known but positive of more than six. In the past three years has experienced pain in the left sciatic nerve. This has been gradually increasing.

History of the mouth as follows: Has been wearing a comfortable full upper plate for past 12 years. Began losing teeth in the upper jaw about 20 years ago. Does not recall any particular trouble with any of those teeth. Roentgenograms revealed unhealed and infected sockets in about the position of the cuspid on the one side and the second bicuspid on the other. Pain was relieved almost at once upon opening and relieving the infected areas.

This case is another which demonstrates that a constant error in metabolism is more apt to produce symptoms which later are often treated as a definite condition, without the readjustment of the fundamental underlying cause of the error.

In citing the next case, I believe it is one in which there is the greatest possibility of the improvement of the patient and the character of case which is too often overlooked. It is such a case as may perhaps be considered one of a more acute type of serious metabolic error, —where resistance and immunity are both de-



FIG. 1.



FIG. 2.

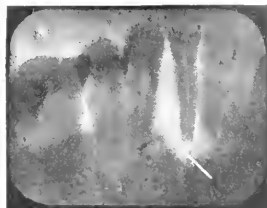


FIG. 3.

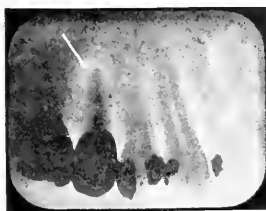


FIG. 4.

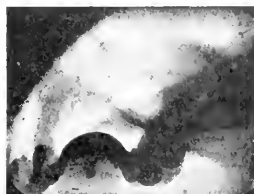


FIG. 5.



FIG. 6.



FIG. 7.



FIG. 8.

FIG. 1.—Rarefied area existing several years after tooth extraction and a chronically infected process about the remaining tooth. FIGS. 2 and 3.—Types of alveolitis dentalis. FIG. 4.—Case of anal sinus infection healed after cure of this area. FIGS. 5, 6, 7, 8.—Types of oral infection commonly seen and untreated.

ficient. It is the type of case most often neglected.

CASE 3. Miss M. A., age 22 years, November, 1916. Housemaid. Had been losing weight at times for the past three years, no cough, but very anaemic. Sought advice of physicians, who agreed she should seek relief in a high and dry climate. About two years ago had several teeth extracted and extensive dental repairs were executed, following which she was fastidious in her care of her mouth. Just previous to calling on me, she was examined by her dentist, who pronounced her mouth in good condition. Roentgenograms revealed several infected areas about teeth and in the alveolar process. There was practically no healing of the alveolar process where the teeth had been extracted. Following the radical operation upon the jaws for the removal of these foci of infection, this patient be-

gan to gain quickly, even before any dental replacements had been executed. Two years later she was again examined by the same physician who had made the original diagnosis of incipient tuberculosis and no trace of her former condition could be demonstrated. During this period the patient continued at her work. She has since married. My last report in this case was to the effect that she is still well.

I believe that a case such as the one above outlined is proof of the contention that health is, in the most part, dependent on "concentration and velocity of reaction" of enzymes in the production of metabolic stability. The rate and intensity of the specific protection of physiologic cell activity are not so often altered, but the "concentration and velocity of reaction" are. A greater demand without any increase in supply surely causes a lessening in

concentration. A demand over a greater area will produce a lowering of velocity with which that demand can be satisfied.

We often note cases of so called "pyorrhea alveolaris," or "alveolitis dentalis," according to Dr. John J. McNulty. Such cases are seen concomitant with a number of general conditions, among them being the glycosurias, tuberculosis, and syphilis. It is not the local infection in the buccal cavity which produces the alterations in metabolism which are capable of the manifestation of such symptoms. Neither is it so likely that the association of metabolic functions of the organism are the sole and primary cause of the maxillary infection. It is most likely true, however, that an association of both, plus a minor and at first delayed infection, is necessary to complete the picture of so serious a local picture of metabolic error such as these are.—an error which may often be corrected by an elimination of the secondary infection as an assistance to the body in its attempt to regain the metabolic equilibrium.

The conclusions which I believe can be drawn from a study of cases of this nature are: that "delayed infection" has not been recognized until it developed to the point termed focal infection; that "delayed infection" produces serious metabolic errors, in the alteration of the function of the various so called "ductless glands;" that a lowering of the resistance of the body opens the way to greater activity for such "delayed infections;" and that the eradication of the infectious focus, long dormant, must be accomplished before a perfect metabolism can be established; that prime among the sources of "delayed infection" is the extraction of teeth, without the resection of alveolar tissue allowing the development of dead space which remains infected; that the errors of metabolism may result from toxic substances not necessarily of bacterial origin; that long continued irritation, infection, or altered function produces pathological conditions; that the treatment of such conditions by symptoms and not by the cure of the exciting cause of metabolic error is only causing a further delay in the eradication of an infection, which ultimately may be discovered as an established focus, somewhere; that "pyorrhea alveolaris" is more truly "alveolitis dentalis," or perhaps, more correctly, "alveolitis maxillo-dentalis."

I wish to acknowledge the great service Dr. John J. McNulty, of New York, has rendered me in collaboration, and in his article "Alveolitis Dentalis," BOSTON MEDICAL AND SURGICAL JOURNAL, February 13, 1919.



#### A BOSTON PHYSICIAN OF FORMER DAYS.

IN an address by Dr. Oliver Wendell Holmes at the Harvard Medical School, originally delivered on November 28, 1882, reprinted in the issue of the JOURNAL for December 7, 1882, and republished in the JOURNAL of April 3, 1919, there is mentioned one of the less well remembered Boston physicians of a former generation, Dr. George W. Otis, Jr. Dr. Holmes refers to him in connection with a medical school which he had joined in forming with Dr. James Jackson, Dr. Walter Channing, Dr. John Ware, and Dr. Winslow Lewis, and which became the foundation of the Harvard Medical School in 1834. Dr. Otis was one of the younger members of this association, and a graduate of Harvard College in 1818. In speaking of his personal qualities, Dr. Holmes characterizes Dr. Otis as "less widely known, but a fluent and agreeable lecturer, and esteemed as a good surgeon." Dr. Otis was a charter member of the Boston Society for Medical Improvement, which was incorporated in 1839, and was a member of the Massachusetts Medical Society from 1826 to 1860. He practised medicine in Chelsea, where he died on August 2, 1872. The following letter written by Dr. Otis in 1822, presenting his observations on surgery in London a century ago, gives an interesting account of the early activities of this Boston physician of former days:

#### SURGERY IN LONDON A CENTURY AGO.

George W. Otis, Jun., to Dr. John C. Warren.  
London, June 28, 1822.

My Dear Sir:

Previous to my leaving America, you requested me to inform you of anything either new or worthy of notice in the profession that I might become acquainted with during my absence. With a view to fulfill this request, I shall undertake to detail to you, as well as I am able within the limits of a letter, some of the observations I have made. If they prove in the

least degree interesting to you, I shall be highly gratified. Since I have been here I have devoted myself principally to the lectures and practise of Bartholomew's hospital, where you know are Mess. Abernethy and Lawrence. The practise here is extensive, and conducted on the same principles as in America; in fact, I see no difference; operations are more rare than I expected, especially at this hospital. Accidents are very numerous, and among them fractures form the greatest part; I observe, however, nothing peculiar in their treatment, except in that of the fractured femur. The patient is laid on his back upon a mattress, fitted to a bedstead fashioned to the shape of two double inclined planes; these are so constructed that they can be elevated or depressed at pleasure, the lower ones meet at an angle under the ham; by this means extension is made by the leg, and counterextension by the opposing thigh; no splints or bandages are used; the heel is fastened to a foot board, the whole apparatus is so constructed as only to operate on the affected limb. This, I believe, is the original principle of Charles Bell, improved by Mr. Earl, a junior surgeon here. In bad cases of compound fractures they don't amputate at this hospital unless the limb is entirely crushed, and then not until some time after the accident. I have certainly seen very bad cases do well by being left to themselves. Mr. Abernethy says he never knew a patient to recover (in London) when amputation had been performed under these circumstances.

I have seen Mr. Lawrence operate for lithotomy twelve times; he uses Blizzards knife; all his patients have done well. In one instance of an old man with enlarged and hardened prostate he met with a good deal of difficulty; he had anticipated this and therefore determined to operate with the Gorget; none of the ordinary sounds were long enough to reach the bladder, so far had it been pushed back by the prostate; after the incision down to the urethra had been made, it was found impossible to penetrate through the gland with the Gorget by the exertion of any justifiable force; he then tried the knife, and after much labor succeeded in making a small opening into the bladder; but to effect this it was necessary to extend the knife the whole length of the blade and most of the handle, so deep had the bladder receded; but now another difficulty arose which had not

been foreseen; the wound was so deep that when the forceps were introduced, the joint penetrated so far that the handles could not be expanded; this difficulty was partly remedied by enlarging the external wound, the calculi were then removed, and the operation finished. I think it was the most tedious and difficult operation I ever saw; the patient was on the table an hour and a quarter. Mr. Lawrence had no hopes of his recovery, but strange as it is, he has not had a bad symptom; the wound is at present nearly healed, but it has been very slow. In the last patient operated upon the urine has passed through the natural passage, without at all coming through the wound. Mr. Lawrence says he has met with one similar case before; he says also that he will never again operate on a patient with diseased prostate, by the lateral method.

I have seen a case of extensive phægaedenic ulceration successfully treated by the application of strong nitric acid, and the mercurial fumigation. I attend the Eye Infirmary. Mr. Lawrence is the senior surgeon. A vast number of cases are here seen; there is nothing, however, particularly new in the treatment; Calomel is given in abundance in all the inflammatory affections, and what is new to me, they find it equally efficacious in strumous subjects. There are a great many cases of Amaurosis; the majority of them are deemed incurable; active depletion with calomel sometimes succeeds. In operations for cataract, Mr. Lawrence uses the common straight needle with cutting edges; in extraction he uses a knife invented by Prof. Beer of Vienna. He never operates on one eye when vision is tolerable in the other. I have seen a few cases of fistula lachrymalis cured by inserting the hollow tube. In general it does not produce much irritation. I have attended the last part of Sir Astley Cooper's lectures at the Boro,' as well as most of the operations at three hospitals. I observe that in operating for lithotomy he makes very small openings in the bladder; and in one case in particular, the orifice that he had made was so small, that in extracting the stone, he used so much force as actually to draw the patient from the table towards him. He afterwards said that as far as his experience went the more the parts were lacerated in this operation the better the patients did; the event in this case proved the truth of his observation, which at first I was

surprised to hear. I have since observed that patients certainly do as well under these circumstances as they do when the opening is large and the stone easily removed.

Sir Astley, you know, is opposed to Mr. Abernethy with regard to amputating in bad cases of compound fracture. A case occurred not long since at Guy's in which he thought it necessary to amputate; it was done in the evening. The next morning, in visiting him with his class, it was observed that the patient suffered greatly from nervous irritation; Sir Astley said, "Gentlemen, you see the state in which this man is in; what must have happened had the limb been allowed to have remained on." The man died in the course of the day, and on examining the stump a ligature was found tight around the nerve. It should be mentioned, however, that during the night succeeding the operation, some hemorrhage occurred, and the dresser tied, as he says, a muscular artery.

About two months since I saw Mr. Key, a junior surgeon at Guy's, take up the subclavian artery above the clavicle, for a subclavian aneurism. The great difficulty was in passing a ligature under the artery. All the different instruments for that purpose failed; it became necessary to enlarge the wound, in doing which the sac was opened; the hemorrhage stopped by pressure until the artery was tied, which was finally done by means of a common probe. The patient was on the table an hour and a half; he died three days later. The parts were removed, but I have never heard the result of the examination.

At St. Thomas's I have seen mostly amputations. In a case of lithotomy in which Mr. Green was operating, from the great hemorrhage he thought that he had cut the pudic artery, but Mr. Travers effectually stopped the bleeding by pressure upon the aorta. Mr. Lawrence mentioned to me a case in which Mr. Earle cut this artery, and that in a short time it stopped bleeding. By the politeness of Mess. Abernethy and Lawrence I have admission to the meetings of the Royal Society and the Medico-Chirurgical as well as the lectures at the College of Surgeons. From Mr. Lawrence in particular I have received the greatest attention as well as advice and assistance, altho I had no claims whatever upon him. I have also become acquainted with Mr. Brodie, who is the present lecturer at the College. His first course this year was upon

digestion. He believes that the bile separates the chyle from the chyme; according to his experiments if the ductus choledochus is tied, no chyle is formed. He notices a curious fact with regard to the ligature of this duct, which is this, that altho the animal manifests icteric symptoms for some days, yet they gradually subside; if the duct be then examined, it will be found that the ligature has ulcerated through and remains enveloped in a quantity of lymph in the centre of the tube, while the bile flows freely around it. The same circumstance occurs after ligature of the intestine, according to Mr. Travers. Mr. Brodie's second course was on injuries of the head, but on this subject he has but repeated Mr. Abernethy's observations.

Sir Everard Home lectured on comparative anatomy; he began by detailing a number of microscopical observations he had made on the blood; he explains in a new manner the formation of vessels in coagula; he says that when the blood is effused, an extravasation of carbonic acid gas takes place, that in escaping it forms grooves or channels in the coagula, that the fluid blood naturally takes the same course, and thus by degrees new permanent vessels are formed. In the same manner he explains the formation of granulations from pus, which he says are the red globules divested of coloring matter. When this pus is exposed to the air, as on the surface of an ulcer, the carbonic acid gas escapes, a vacuum is produced, the channels through which it passed are immediately filled with fluid blood; thus it is that the globules of pus become vascular and assume the name of granulations. This grand discovery, says he, which has eluded the observation of the Hunters, has been left for him to bring to light. He is without exception possessed of the greatest share of vanity of any man I ever heard. People here place no confidence in his assertions; altho he holds the distinguished rank of President of the College. At a late meeting of the Medico-Chirurgical Society, I heard an interesting paper read by Mr. Earl, on artificial joints. He related three or four cases where he had performed the operation in different manners without any permanent success. He seemed to think, however, that the method proposed by Dr. Physick promised the most. Mr. Travers observed that he considered the local causes that prevented the union of fractured bones to be three; first, neglect to keep them perfectly still



and in due apposition; second, a denudation of the periosteum,—in this case no long union can possibly take place; third, from the intervention of a portion of muscle or a piece of dead bone between the fractured surfaces. These he thinks are all the local causes; he don't believe in any specific or peculiar action in the affected parts which prevent union. But there are constitutional causes which may exist; in such cases the cure can be effected only by general treatment; no local application or operation can have any effect. The question was asked why it was that the humerus was the bone most generally affected in this manner? The same evening a paper was read giving an account of the performance of the Caesarean section. A woman in the 9th month of her pregnancy was run over by a carriage and instantly killed. The body was immediately carried to Guy's Hospital, and the operation performed by Dr. Blundell. Artificial respiration was kept up in the child for about 15 minutes from the time of its removal from the body of its mother; it then began to respire of itself; a little brandy and water was given to it, which decidedly produced a bad effect. It was that night given to a woman to nurse, but it died in about thirty hours from its birth. A case was also related of a woman in some part of Germany, who, near the time of labor, while sitting one evening with her family, suddenly heard the cry of a child proceeding from within her. Thinking that she was about thus unexpectedly to be delivered, she immediately sent for her accoucheur, but on his arriving no pains had come, neither did the patient feel the least uneasiness, but the child continued to cry. Upon examination the os uteri was found not at all dilated. She continued in this state a number of days, the cries of the child being occasionally distinctly heard. At last labor pains came on and delivery was naturally effected. No comment was made on this singular case, which, if true, militates strongly against our commonly received notions of foetal existence.

There is at St. Thomas's hospital a remarkable case of hydrorhynchus: the patient is a young man about 25, the largest diameter of his head measures 33 inches, the enlargement has been gradual from infancy. His mental powers are not impaired; on the contrary he appears much more intelligent than the generality of hospital patients. The only difficulty he com-

plaints of is a giddiness in going up stairs or in ascending a hill; he says that he formerly had fits. Mr. Chandler, one of the old surgeons at this hospital, died about a fortnight since. Mr. Tyrrell, the junior surgeon at the Eye Infirmary, has been elected to his place. I have, during the spring, attended the lectures of Dr. Armstrong on the Theory and Practise of Physick; but in him I have been much disappointed. I have also attended Drs. Gooch and Conquest on Midwifery; they lecture in conjunction. Dr. Gooch is considered the best lecturer in this branch in London. I should have attended Dr. Haighton, but he has given up lecturing.

I have lately been to Scotland; while in Edinburgh I attended the Infirmary, but I saw nothing of particular interest there. Dr. Judson has been here with me during the winter and spring. We intend going very soon to Paris, where probably I shall remain some time.

I have troubled you with a very long and I doubt not tedious letter. If, on the contrary, it should prove in the least degree interesting, I shall consider myself fortunate in having afforded the slightest remuneration for the kindness and attention I have experienced from you during my professional pupillage. Allow me to assure you that it shall be my greatest object during my future professional career, so to conduct myself as to obtain and preserve your approbation. That you may continue through a long life to enjoy the high reputation you already possess; that health and happiness may continue to attend yourself and family is the sincere wish of your former pupil, who, with deference will ever be happy in considering himself your friend and servant.

GEORGE W. OTIS, JUN.

Dr. John C. Warren.

If I could be of service in procuring you any books or preparations while in Paris; or if otherwise you should see fit to write me a letter directed to the care of Mess. Wells & Williams, Banquiers, Rue Faubourg Poissonniere No. 26, would reach me. Otis.

[Addressed] Dr. John C. Warren, Boston, Mass., America. Per Triton, Capt. Bussy.

## AMBULATORY TREATMENT OF FRACTURE OF THE FEMORAL NECK.\*

BY E. H. BRADFORD, M.D., BOSTON.

ORTHOPEDIC SURGERY needs a new definition of its scope. The original field of *l'orthopédie* (*ὀρθος παιδεύω*), as Andral named the specialty, was confined to the prevention and cure of deformities; but later practice has changed its barriers. General surgeons have cured deformities, physicians have prevented them, and venturesome orthopedic surgeons have invaded the field of general surgery. This has led to unjust criticism and depreciation of the value of a specialty which fills an important place in the spectrum of surgical achievement. It has been suggested by the envious that the success in orthopedic surgery was often won by men who, ill-trained and incompetent as surgeons, exploited themselves and concealed their lack of knowledge through the chronic character of the ailments treated, nature curing in spite of clumsy art.

On the other hand, one of the most influential of orthopedic surgeons claimed that his specialty was the only one in surgery fully justified by the nature of things. The achievements of the specialty are sufficient to refute the charge that it is the refuge of those who could never be surgeons. But it is important that those undertaking the branch of the work of the profession should understand clearly the character of the skill demanded and for which training should be sought.

The development of the art of surgery has been so great and the demand for technical skill so pressing, that surgery itself, but recently separated from medicine, has sub-specialized extensively. The dentist, the ophthalmologist, the laryngologist and otologist are especially sought by the public on account of their special experiences, as are the gynecologist and urologist. The latter, however, may also be excellent, active general surgeons; but the status of the orthopedic surgeon is somewhat different, owing to the fact that he treats tediously chronic affections and must master many non-operative details. Dealing with the functions of activity and locomotion he is not trained to consider one organ alone; but must be familiar with remedies useful to relieve the disabilities of many varieties of tissues. The modern general

surgeon trains his energies largely to operative skill. He needs to be able to meet an emergency or an urgent pathological condition with the exercising of highly trained skill planned to relieve or cure in a concentrated effort demanding quick energy, judgment and decision.

After his bold and responsible undertaking, the surgeon can leave the patient to the care of convalescent nursing. As was said by a prominent and successful surgeon, a patient not cured in a month was a reproach to be avoided. With the orthopedic surgeon the demand is different. He needs to face his responsibilities squarely and not to shuffle or dodge; in fact he must be a surgeon and a highly trained one; but he can and should be deliberate. He must husband and marshal all the recuperating forces of the patient for the restoration of perfect function, not for the mere saving of life. He may need to operate and, if so, he must operate with consummate skill and the least possible injury of tissue. A patient at the hands of a wise surgeon may not miss the loss of a slice of intestine, but the loss of a square inch of bone from the hand or foot may be a calamity.

To the orthopedic surgeon an operation is but one step in the treatment and not the cure-all or end-all of his undertaking, which may demand months of attentive skill.

For this reason he needs thorough training in other branches than technical surgery and if so equipped is justified in attempting to aid those afflicted with chronic surgical ailments. This special branch of surgery has by the accumulated experience of many years of observation and investigation added much to the common store of surgical knowledge. It has given precision to the methods for the operative cure of club foot, of rachitic deformities now easily and definitely curable by any properly trained general surgeon. It has added much to the medical understanding of the treatment of paralytic affections. It has given a sound, scientific basis for the successful management of cases of tuberculous bone and joint diseases. But there are many other directions in which surgery and the community can be aided by the study and services of surgeons trained as the orthopedic surgeon must be to the mastery of non-operative detail.

Orthopedic surgery in short is the branch of surgery which demands mastery in non-operative details.

\* Read at a meeting of the Surgical Section of the Suffolk District Medical Society.

Illustrative of what may be done by orthopedic surgeons, attention may be called to important aid given by the proper use of apparatus: the accompanying case may be cited.

The following case, in the excellence of the results obtained, deserves to be recorded. The patient, an employee at the Massachusetts Hospital School for Crippled Children, fell and sustained a fracture of the neck of the femur on February 18, 1918. Immediately after the accident and before the patient was moved from the place in which she fell, she was examined by the superintendent, Dr. Fish, by resident physicians of the hospital, and also by two physicians who happened to be present at a meeting of the Medical Advisory Board held at the institution. The case was later seen by Dr. Bradford. The diagnosis was clear from the presence of the usual symptoms of shortening, eversion, and crepitus; but to admit of no doubt the clinical symptoms of the injury were confirmed by the x-ray. As the patient was sixty-four years of age and older in her condition even than her years, the usual unfavorable results of this fracture from long confinement in bed and joint stiffness following long fixation threatened a serious affliction of permanent if not total disability to a dependent, working woman without home or resources. It was determined to avert such a calamitous outcome of the injury by ambulatory treatment, making use of the traction abduction appliance which had been found to be of great service at the Hospital School in the treatment of hip disease. This appliance, which may be defined as a perineal ring crutch with a traction attachment and an abduction arm pressing upon the side of the perineum opposite the fracture, furnishes more fixation at the hip than can be obtained by a plaster spica. It also provides a practical amount of abduction without the encompassing pressure of a plaster bandage, which causes atrophy of the fat, muscle, and, as has been shown by skiagram, also of bone tissue, and therefore is not favorable to bone healing. It has been found by experience at the Hospital School that the traction abduction splint, even in the acuter stages of hip disease, provides thorough traction and sufficient fixation to permit a painless change of position and motion in bed, and that locomotion with crutches is not only feasible, but beneficial, in the sub-acute stages and favors a better cure.

It was therefore thought that the apparatus might be useful in the treatment of this fracture; that traction would pull the fragments into place; furnish fixation; give the proper abduction and allow the patient to sit up and be moved from the bed without injury; that the pericapsular ligament and muscular fasciae would be prevented from cicatricial contraction, preventing resulting joint stiffness; and that early crutch locomotion with splint protection would be made possible. The result justified the treatment. The patient was first placed upon the gas pipe bed frame and traction applied by the use of weights and pulleys; but within forty-eight hours, or as soon as the apparatus could be made, the traction abduction splint was substituted for traction bed weight and pulley traction and the patient allowed to move about and to be moved more freely. The pain and discomfort which were experienced the first night were controlled by the hypodermic administration of 1/12 of a grain of morphia, but at no time was any other medication indicated except an occasional mild laxative, and on February 28, ten days after the injury and eight days after the splint was applied, the patient sat up in bed to eat her supper. Seven days afterward, on March 7, she left her bed and spent part of the day upon a couch. Five days later, on March 12, she moved about her room in a crutch walking frame in which she had greater confidence than upon a pair of crutches. She soon became accustomed to the use of crutches, however, and in pleasant weather was able to be out-of-doors.

All traction was removed on April 15. Fifteen days later the splint was removed entirely at night and for short periods which were gradually increased each day until it was taken off altogether on May 18, three months after the injury.

The patient gradually regained the use of her leg. In the autumn she felt able to resume her work and re-entered the employ of the hospital. She can flex the thigh to a right angle, move the joint freely, and walk several miles without limping or the slightest discomfort. There is no appreciable shortening—in fact, she considers herself fully recovered and capable of work, which keeps her upon her feet eight or nine hours daily.

Two other cases, coming under the writer's observation in consultation, have since been

treated by the same method; one a fracture of the neck of the thigh in a woman of forty, the other a fracture of the femoral shaft in a woman of seventy-five, and the results in each have been most gratifying.

NOTE: The patient was shown at the February meeting of the Surgical Section of the Suffolk District Medical Society.

### Book Reviews.

*Physiology and Biochemistry in Modern Medicine.* By J. J. R. MACLEOD, M.B., assisted by Roy G. PEARCE, B.A., M.D., and others. With 233 illustrations, including 11 plates in colors. St. Louis: C. V. Mosby Company. 1918.

The need of the clinician for deeper appreciation of fundamental subjects has resulted in a sequence of texts designed to interpret the more important phases of biochemistry, physiology, and pathology. In Professor Macleod's book we have the first attempt on the part of a physiologist to do this, other volumes of similar nature having come from clinicians. There is no possible doubt as to the value of the intention behind such publications, and there is equally no doubt as to the extreme difficulty attendant upon carrying out such purpose. Knowledge of fundamentals must be coupled with a selective capacity of high order.

Professor Macleod opens his book with nine chapters upon the physical chemistry of the human body. The treatment is extremely brief, covering but 84 rather readable pages. There is no attempt to do more than present the briefest sort of outline of such subjects as "The Principles Involved in the Determination of Hydrogen-ion Concentration," "The Regulation of Neutrality in the Animal Body and Acidosis," "Colloids," and "Ferments, or Enzymes." One often wonders in reading such summaries just how much could be gained from them if one was unbacked by a certain amount of preliminary information and above all by a certain habit of mind, as such material needs more than willingness for its assimilation.

When one attempts to analyze the chapters in the book dealing with the special systems of the mammalian body, he is too steadily confronted with the feeling that he is reading a rather well written text-book of physiology or biochemistry in which is no steady compulsion to feel the intimate relation of these subjects to modern medicine. This is peculiarly true in the discussion of the circulation. One feels

here that the chapters upon control of the circulation should be followed by specific examples of the manner in which this control operates under conditions of exercise and activity, with indications as to the most vulnerable points in the entire mechanism. Similarly, in the chapters upon the nervous system, one finds too little direct application of physiological knowledge.

It is perhaps unfair to demand that the authors of such a book detail modern physiology and biochemistry and at the same time indicate directly how such information should be used. Such, however, would seem to be the duty of a text in applied science. One needs to gain from it not only statements of what should be applied but how it should be applied.

In general details of arrangement and manufacture, the book leaves little to be desired. It would be more useful, perhaps, to give larger bibliographies on certain subjects; but in the main, the selections are good and will serve as a useful starting point for readers who desire to follow particular subjects in greater detail.

*War Time Nerves.* By HERBERT J. HALL, M.D. Boston and New York: Houghton Mifflin Company. 1918.

The present war is testing the nervous strength of the nation, and the strain is being felt not only by the fighting man, but also by the men and women who remain at home. How is the nation to maintain its normal vitality and efficiency? A solution of this problem is offered by "War Time Nerves," written by a man whose profession, pursued with a sympathetic understanding of his patients, has enabled him to offer invaluable suggestions to persons suffering from nervous overstrain.

The soldier or the sailor, witnessing daily the cheapness of material life, is forced to a recognition of the stability and grandeur of spiritual life and feels strengthened by it. Likewise, the man at home, whose vitality may have been lowered until the sense of personal failure almost overwhelms him, may be made more efficient and happy if he can be shown how to rise above his physical limitations and feel that his life, if he makes the best of it, is a small part in an eternal purpose. The method of treatment varies with the patient, whose physical and spiritual life should be carefully observed. Often the removal of some fear or misconception, the establishment of a life purpose, or instruction in some manual art may serve to relieve the condition. But the author's particular message is his plea for a new vision, for the ability to regard actual facts as symbols of a higher and finer life. At this time especially, it is in this guidance of the spirit, in addition to physical assistance, that physicians can render the greatest service to humanity.

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## MASSACHUSETTS COMMISSION FOR THE BLIND.

THE Massachusetts Commission for the Blind undertakes to find and register new cases of blindness, to follow up cases which have already come to its attention, to adopt whatever measures may be possible for the prevention of blindness, to give specialized education, and to promote the efficiency and happiness of the blind by whatever means may be possible and practical. The twelfth annual report for the year 1918 states that the year has been a particularly difficult one because war conditions have caused the interest and financial support of the public to be diverted. One advantage, however, to be gained from the war is the fact that the return of about thirty-five American soldiers who have been blinded by the war has caused many to reflect more deeply on the problems involved in educating the blind.

The Commission adopted a new policy last

year. Five totally blind workers were appointed to the staff, to make it possible to determine whether the blind social worker can produce results equal to the work done by normal workers. Thus far, the experiment has seemed to justify itself. It is the policy of the Commission to employ the blind in various departments of work whenever it is possible to do so.

In order to give all blind individuals a knowledge of the Commission's purpose, a survey has been made by three blind workers in order to register all the blind of the state. Names have been received from overseas of the poor, oculists, and local charity organizations, and efforts have been made to investigate and determine the educational, industrial, financial, and social status of the individual. A survey of Worcester, Bristol, and Norfolk Counties showed a total registry of 2,415 names. In order to further the relief of the blind, the Commission has recommended to the state, legislation to meet the needs of this class.

Among the children of Massachusetts, there is a group of about five hundred who will later become a burden to the community unless proper education is provided for them. For these children who are not totally blind, a special class was organized in 1913 under the Boston School Board. There are now ten classes of this sort in Massachusetts, with a total enrollment of one hundred and thirteen children. It has been estimated that about one child in every thousand requires the methods of the sight-saving class. Massachusetts has classes at present in Boston, New Bedford, Cambridge, Lynn, and Worcester. Through the Massachusetts Charitable Eye and Ear Infirmary, medical and surgical care has been provided for about five hundred children.

The work of the Commission toward the prevention of blindness has placed before the public facts concerning the common causes of needless blindness, preventive and remedial measures, resources of the Commonwealth for helping the blind, and the essential matters that teachers of the blind should know regarding their work and education.

Home teaching of the adult blind has been increased by an additional appropriation of \$1500. The total enrollment during 1918 was 274, and the amount of money earned by these pupils amounted to \$799.04. A special course

in advertising and salesmanship was given, with gratifying results, at the Thomas Park House by Professor Harold Whitehead.

The industries in Cambridge which have afforded training for the blind include chiefly the broom, rug, wundermop, dowel, basket and rattan industries. In Worcester and Lowell, the principal industry is chair caning. The Woolson House industries have afforded ample opportunity for work in spite of unsettled conditions and increased cost of materials. An experiment has been made by the Commission to determine the chance which a blind person might have in various industries in competition with the seeing. One hundred factories, including leather, paper, envelope, corset, drug, glue, ammunition, shoe, and candy concerns and various machine shops, were visited. As a result, fifty blind workers were given positions, and forty-nine made good. This is a greater proportion than would be expected even among seeing workers. Regular employment has been secured for two hundred and eleven persons.

This report indicates the magnitude of the problem of dealing with the blind. The Commission deserves commendation for its faithful service during the past year, and merits increased interest and support from the general public.

### UNITED STATES PHARMACOPOEIAL CONVENTION.

THE attention of physicians is called to the tenth decennial United States Pharmacopoeial Convention to meet in Washington, D. C., on the second Tuesday of May, 1920, at ten o'clock A.M. at a place to be named later. All competent and designated bodies and authorities are asked to name and issue credentials to a fixed number of delegates, who are requested to forward them promptly to Noble P. Barnes, M.D., The Arlington Hotel, Washington, D. C.

The following By-Laws of the United States Pharmacopoeial Convention provide information with which physicians should be familiar:

Article VIII, Chapter I, of the By-Laws of the United States Pharmacopoeial Convention provides that the President:

"Shall issue, on or about the first of May of the year immediately preceding that of the decennial meeting, a notice inviting the several bodies, entitled under the Constitution to representation therein, to send delegates to the next

meeting. He shall repeat the notification, eight months later, and shall request the medical and pharmaceutical journals of the United States to publish the call for said meeting."

Article II of the Constitution provides:

"The members of the United States Pharmacopoeial Convention, in addition to the Incorporators and their associates, shall be delegates elected by the following organizations in the manner they shall respectively provide: Incorporated Medical Colleges, and Medical Schools connected with Incorporated Colleges and Universities; Incorporated Colleges of Pharmacy, and Pharmaceutical Schools connected with Incorporated Universities; Incorporated State Medical Associations; Incorporated State Pharmaceutical Associations; the American Medical Association, and the American Chemical Society; provided no such organization shall be entitled to representation unless it shall have been incorporated within and shall have been in continuous operation in the United States for at least five years before the time fixed for the decennial meeting of this corporation."

Section II of the Constitution provides:

"Delegates appointed by the Surgeon-General of the United States Army, the Surgeon-General of the United States Navy, and the Surgeon-General of the United States Marine Hospital Service, the Secretary of Agriculture, the Secretary of Commerce and Labor, the Association of Official Agricultural Chemists, the Association of State and National Food and Dairy Departments, the National Wholesale Druggists Association, and the National Dental Association, and the organizations not hereinbefore named which were admitted to representation in the Convention of 1900, shall also be members of the corporation. Each body and each branch of the United States Government above mentioned shall be entitled to send three delegates to the meetings of this corporation. But no such delegates as are provided for in this article shall be members until their credentials shall have been examined and acted upon as provided for by the By-Laws."

This meeting of the United States Pharmacopoeial Convention of 1920 is announced nearly a year in advance because it will mark the first century of the Pharmacopoeia and will be the most important of the decennial meetings.

### A STUDY OF THE INFLUENZA EPIDEMIC.

A STUDY of the recent epidemic of "Spanish" influenza, published in February by the French Scientific Academy and in the issue of the *Lancet* for April 19, has been contributed by Dr.

J. Dolley, who believes that he has discovered and cultivated the germ of the so-called "Spanish" influenza. He believes it to be a small bacillus of less than a millionth of a millimeter in size, intermediary between the bacillus pestis and the chicken cholera bacillus. In discussing the symptomatology of the disease, Dr. Dolley expresses his belief that symptoms which are likely to manifest themselves during the course of development are diminution of arterial tension, irregularity of and variations in the strength of the pulse, weakening and even imperceptibility of the first sound of the heart, precocious cyanosis of the fingernails, enlargement of the spleen, slight enlargement of the liver, "Sergeant's white line," considerable asthenia, slight delirium when temperature is very high, irritability contrasting with the intellectual torpor, signs of the lungs being affected, but in no precise locality, frothy expectorations which contain thin streaks of bright red blood, slight diarrhoea, urine clear and abundant, hemorrhage in any of the mucous membranes, and cardiac syncope.

The author believes that this symptomatology points to a specific disease for the reason that the majority of these symptoms are noticeable in practically all cases of "Spanish" influenza, and all of them may be reproduced in man by inoculation with the expectorations mingled with blood, produced by persons suffering with the disease.

In support of his theory, Dr. Dolley cites his own personal experience. On October 27, 1918, his thumb was bitten by a rat which he was smearing with the expectorations of a patient who was affected seriously by the disease. The following day, cyanosis was noticeable in the fingers of the left hand, the beating of the pulse in the radial artery was no longer perceptible, there was a sensation of intense cold, and fits of fainting and bradycardia occurred. These symptoms continued, and on November 15th, a short frequent cough producing a few frothy expectorations containing fine streaks of bright red blood, became noticeable. The symptoms increased until on December 12 his condition became critical, and a serotherapeutic treatment was begun.

During the first stage of the disease, Dr. Dolley succeeded in isolating a coccobacillus in the swelling on the thumb; and during the final stage, it was rediscovered in his venous blood.

He observed that the coccobacillus could be successfully isolated in the ease of a great many individuals affected by the epidemic, and that it generally disappeared from the blood in circulation when complications existed and rise in temperature took place. He believes that certain symptoms of this epidemic resemble hæmorrhagic septicaemia, and therefore employed a serum obtained with a microbe of this group, for example, the anti-plague serum. He states that the first injection of twenty-five cubic centimeters of anti-plague serum resulted in the cessation of fainting fits and the disappearance of other circulatory phenomena. The disease reached such an advanced stage in some cases that it was necessary to use the contents of ten bulbs in order to effect a complete cure. Dr. Dolley thinks that patients suffering with pulmonary complications and nervous forms, such as ataxo-adyndamia, can be treated successfully with this same serum. Since the time when he adopted this treatment in the form of intravenous injections, for patients suffering with syncope, and in the form of subcutaneous injections in other cases, not one of his patients has died as a result of "Spanish" influenza.

Dr. Dolley concluded from his experiments with mice that this serum afforded protection against inoculation by the coccobacillus of influenza, and that it could even cure mice who were already affected by the disease.

#### MEDICAL NOTES.

INFLUENZA IN ALASKA.—An epidemic of influenza is spreading among about five thousand persons in Alaska, most of whom are employed in the salmon canning industry. In order to relieve the present distress and to check the disease, naval ships carrying surgeons and large quantities of medical supplies have been dispatched to the Bristol Bay region. Nearly all the naval medical men available on the northern Pacific Coast are working among the natives, and additional supplies and doctors are being sent to Puget Sound. The hospital ship *Comfort* left Charleston, South Carolina, on June 9, with the intention of sailing to Alaska if the epidemic should not be under control by the time the vessel reached the west coast. The southeastern portion of Alaska has not been seriously affected by the epidemic. Deaths in Bristol Bay sections have been increasing at an alarming rate, and sixty persons died in one small com-

munity in one day. An appropriation of \$100,000 for the relief of the Alaska influenza sufferers was included in the general deficiency appropriation bill by the Senate Appropriations Committee.

**HOSPITAL WORK IN THE BALKANS.**—American, British, French, and Greek doctors are endeavoring to prevent an outbreak of the plague in the region extending along the north shore of the Aegean Sea, from Salonica to Constantinople. Reports from the American Red Cross state that the condition in Drama, Serras, Kavalla, Xanthi, and hundreds of other small villages are exceedingly unsanitary. From the Red Cross warehouse at Kavalla, housing three hundred families of refugees, from five to a dozen persons who had died of typhus were removed each day last month. Among the children of Eastern Macedonia the conditions are particularly pitiful. Two members of the American Red Cross have died in the Balkans during the past month, and several other nurses have been ill with typhus. Serums against disease are injected in thousands of peasants, and "delousing" baths are given to those living in the crowded centers.

A recent report from the doctors from the American Women's Hospitals who are now in Serbia and Albania states that in some parts of the country four years have passed without the visit of a physician. Dr. Keyes who directs a hospital staffed entirely by women at Monastir, has reported that the work is increasing and that the daily dispensary cases often number from 230 to 250 people. Typhus is considered well under control. The number of accidents from explosives is great, and one ward is entirely devoted to these cases.

**DECORATION OF AMERICAN WOMEN FOR MEDICAL SERVICE.**—A number of American women physicians from the American Women's Hospital at New York, who are now assisting the American Red Cross in caring for the sick and destitute in Serbia, Montenegro, and Albania, have been cited for conspicuous service. They are Dr. Marjorie Burnham, Dr. Mary H. Elliot, Dr. Harriet M. Gervais, Dr. Alberta M. Greene, Dr. Lulu Peters, Dr. Marion C. Stevens, Dr. Regina F. Keyes, Dr. Mabel Flood, and Dr. Catherine M. Cook.

The service rendered by Dr. Keyes is especially to be commended. At the first call from Greece, she went to Voden, where with a few

medical supplies she organized an emergency hospital. She had no operating tables, no sterilizers, no beds, no stove, nothing except her small kit of surgical instruments and a few pounds of medicines. An operating table was built of a few dry-goods cases and some iron beds were borrowed from an abandoned military hospital. Old gasoline cans were utilized as stoves, dishes, sterilizers, and everything needed to aid in an emergency. With this equipment, with the aid of Dr. Mabel Flood and two American nurses, Dr. Keyes opened the first American hospital in Northern Greece. During the attack of the French and Serbians on the Bulgarians, Dr. Keyes served the French Army as regimental surgeon. Dr. Keyes is stationed at Monastir, Serbia, at the present time.

A second relief unit under the auspices of the American Women's Hospitals is expected to sail for service in Serbia before July 1. Dr. Mary M. Crawford of New York will be in charge of this unit.

**UNDERNOURISHED SCHOOL CHILDREN.**—It has been shown by the New York City Health Department that the school children in that city have shown a marked increase in undernourishment during the last three years. Statistics show that since 1914, five per cent. were undernourished; in 1915, six per cent.; in 1918, nineteen per cent. This is due to insufficient or wrong feeding. Since the beginning of the war, the average increase in wages has been eighteen per cent., while the average increase in the cost of food has been nearly one hundred per cent. At the present time, one child out of five in New York City is seriously undernourished, and at least two additional ones out of every five are classed as being between good health and an undernourished condition.

**FEDERAL HEALTH PROGRAM.**—On behalf of the War Service Committee of the American Hospital Association, Dr. S. S. Goldwater has complained that the Treasury Department, to which President Wilson referred the proposed Federal Health Program, has taken no steps to complete the task. On July 1, 1918, all sanitary or public health activities carried on by any government bureau were given over to the Treasury Department. Among the recommendations presented by the members of the conference were the appointment of an Assistant Secretary of Health for the duration of the war and for the creation of a Committee on Public



Health. Following are some of the more important projects anticipated:

The establishing of standard procedures for the control of communicable diseases, including reporting diagnosis, treatment, and sanitary supervision, and the adoption of these standards by local authorities. Particular attention is to be paid to malaria, hookworm disease, typhoid fever, tuberculosis, and the communicable diseases of childhood.

A comprehensive program for the hygiene of war industries is to be prepared and put into effect. Among the matters for special attention should be adjustment of the hours of labor to obtain maximum production without damage to the health of the workers. Special attention should be given to the diseases which seriously reduce the efficiency of farm labor in southern states.

Standards for maternity care and for the preservation of the health of infants and children should be prepared and promulgated. A plan should be prepared and put into effect for the registration and after-care of men enlisted or drafted for military service and subsequently rejected or discharged on account of mental or physical defects. This should include, for example, extension of facilities for the sanitarium and home care of tuberculosis victims and for hospital and home treatment for mental defectives and drug addicts.

To insure the quality and make reasonable the cost of essential drugs and biological products, standard methods of manufacture and standards of potency should be developed and enforced. A comprehensive propaganda of health education adapted to various localities and all classes of people should be developed.

Steps should be taken to provide for the national registration of deaths, births, and cases of preventable diseases. A program should be prepared for maintaining an adequate supply of properly trained sanitarians, physicians, and nurses during the war. The means for the extension of existing training facilities should be provided by the government.

The program was prepared by Dr. John F. Anderson, formerly director of the United States Hygienic Laboratory; Dr. Haven Emerson, formerly health commissioner of New York; Dr. W. A. Evans, formerly health commissioner of Chicago; Lee K. Frankel, vice-president of the Metropolitan Life Insurance Co.; Dr. A. W. Freeman, of the Ohio state health department; Dr. Goldwater; Porter Lee, of the New York School of Philanthropy; Dr. W. S. Rankin, state health secretary of North Carolina; Dr. E. G. Williams, state health commissioner of Virginia, and Dr. C. T. A. Winslow, professor of public health at Yale University.

**INFLUENZA AT SAN QUENTIN PRISON, CALIFORNIA.**—During 1918, there were three distinct epidemics of influenza, in April, October, and November, at the California State Prison. From an analysis of these epidemics in a recent Public Health Report, it seems probable that each epidemic was introduced by the entrance of a recently infected prisoner. The disease, thus brought into crowded, poorly ventilated rooms, spread quickly because of the close contact of the inmates. The second epidemic was less severe than the first, and the third was less severe than the second. In the first and second epidemics, the disease attacked prisoners chiefly between the ages of twenty and twenty-five; in the third, more persons between the ages of twenty-five and thirty, and forty and forty-five became infected. It was discovered that the spread of the disease could be most effectively combated by hospitalization, quarantine, isolation, and closing of congregating places. Men who entered the prison after the April epidemic seemed to be more susceptible to the disease than those who had entered previously. Of those who contracted influenza during the first epidemic, five per cent. developed tuberculosis.

**RED CROSS APPEAL.**—The following statement, relating to an appeal to be made by the American Red Cross next November, has been issued recently by Dr. Livingston Farrand:

"Appalling conditions in the countries of Eastern Europe, imposing on the American Red Cross obligations additional to those assumed during the period of the world war, and the continuance of activities in connection with the already outlined domestic program of the Red Cross, makes necessary an appeal to the people of America for further funds to carry on the work for the relief of humanity.

"It has been decided to make this appeal in the autumn, in a period of two weeks, culminating on the eleventh of November, the anniversary of the signing of the armistice—a season when the American people may properly give manifestation, through contributions to their Red Cross, of their thankfulness for deliverance from added horrors of war which have fallen upon nations less fortunate.

"At present the American Red Cross is bringing to a close its activities in the countries of Western Europe, and with the withdrawal of American troops from the war zone its work for the Army abroad will end automatically. Dis-

ease and suffering of the most heartrending character, however, are calling for relief in other fields. The new international organization of Red Cross societies is preparing to deal with relief and health problems throughout the world in future years, but there are immediate emergencies which require the aid of the agencies already established. Foremost among these agencies is the American Red Cross. At present emergencies are being met with all the resources available, but it is apparent that the imperative calls for assistance for the next year or more will make additional funds necessary.

"It is anticipated that the generous heart of the American people will respond to the appeal to the full extent of the needs that will present themselves."

**NATIONAL SOCIETY FOR THE STUDY AND CORRECTION OF SPEECH DISORDER.**—A meeting of the National Society for the Study and Correction of Speech Disorder will be held in Milwaukee, Wisconsin, on July 4, 1919. Previous meetings in Cleveland were held on May 19 and May 30. The next meetings of the Society will be held in Milwaukee, on July 4, 7, and 30; in Athens, Ohio, on August 4 and 29; in Lowell, Massachusetts, on September 8, and in Cleveland on October 6. The meetings on July 4 will be held in conjunction with the National Educational Association.

**NOTIFIABLE DISEASES IN THE UNITED STATES.**—The United States Public Health Service has published in Reprint No. 505 from the Public Health Reports a summary by months and states of the prevalence of the following notifiable diseases in the United States during 1917, with tables showing mortality rates of the various diseases: anthrax, cerebrospinal meningitis, diphtheria, malaria, measles, poliomyelitis, rabies in man, Rocky Mountain spotted fever, scarlet fever, septic sore throat, smallpox, tuberculosis, and typhoid fever.

**88,000 CASES OF TUBERCULOSIS IN THE ARMY.**—It has been announced by the National Tuberculosis Association that sixty-two thousand men were rejected for service in the national army because they were suffering from tuberculosis; approximately twenty thousand were rejected for the same reason at the army camps; and nearly six thousand who are now still in service

are being cared for in the army's special tuberculosis hospitals. The National Tuberculosis Association is coöperating with the surgeon-general's office in following up each rejected case, and fifteen hundred state and local societies are providing necessary care and treatment.

**FREE TREATMENT OF VENEREAL DISEASES.**—A list of hospitals and dispensaries in the United States where those infected with venereal diseases may secure treatment free of charge has been printed in the Public Health Report for May 2, 1919.

**VENEREAL DISEASE WORK IN NEW YORK.**—The sum of four thousand dollars has been allowed monthly by the State Department of Health for conducting anti-venereal disease work in New York City. On the basis of this allowance, the Department has established ten clinics for the treatment of venereal diseases in quarters already occupied as tuberculosis clinics. Hours have been arranged so as not to interfere with the work of the tuberculosis clinics; four daily sessions and two evening sessions will be held each week. Nine of the clinics will have purely advisory and diagnostic functions; one, however, the Chelsea Clinic, will administer free treatment to all cases of venereal diseases among indigent patients. These clinics will conduct preventive and educational work on a district basis, assigning to each district two clinic physicians, a lecturer, and a nurse. The *Weekly Bulletin* of the Department of Health of New York City contains a list of these clinics, with the hours of attendance.

**DIVISION OF VENEREAL DISEASES.**—There are two hundred and fifty clinics being operated by, or in conjunction with, the United States Public Health Service, Division of Venereal Diseases. A summary of the activities of thirty-three of these clinics has been published in a recent Public Health Report. During the month of March, 2,869 new cases of venereal diseases were admitted, making a total of 11,931 patients under treatment. The average daily attendance during March was 47.9, as compared with 32.7 for the month of February. A large number of these clinics are no longer under the absolute control of the Government and the Red Cross, but are now controlled and financed by state and local health departments.

## BOSTON AND MASSACHUSETTS.

**WEEK'S DEATH RATE IN BOSTON.**—During the week ending June 7, 1919, the number of deaths reported was 232, against 216 last year, with a rate of 15.19, against 14.36 last year. There were 29 deaths under one year of age, against 39 last year.

The number of cases of principal reportable diseases were: Diphtheria, 51; scarlet fever, 48; measles, 34; whooping cough, 11; tuberculosis, 47.

Included in the above, were the following cases of non-residents: Diphtheria, 2; scarlet fever, 12; tuberculosis, 4.

Total deaths from these diseases were: Diphtheria, 2; whooping cough, 2; tuberculosis, 16.

Influenza cases, 7; influenza deaths, 1.

**INCREASE IN TUBERCULOSIS IN BOSTON.**—It is the belief of Seymour H. Stone, secretary of the Boston Association for the Relief and Control of Tuberculosis, that tuberculosis is increasing in Boston. He is reported to have stated that this is probably due in part to the great increase in work and the high wages paid during the war; for men and women who should have been under treatment at hospitals, in sanatoria, or at home, have been tempted to work, even at the expense of their health.

Possibly other reasons for the increase in the Tuberculosis death rate from 13.82 out of every 10,000 residents of Boston in 1915 to 15.12 in every 10,000 in 1918 are the high cost of food and the lack of physicians and nurses due to war conditions. Mr. Stone has emphasized the importance of keeping before the public the importance of good health as a defence against tuberculosis, and the desirability of seeking early competent advice.

**HARVARD CANCER COMMISSION.**—Dr. Robert B. Greenough has been appointed director of the Cancer Commission of Harvard University. Other members of the staff are: Dr. Channing C. Simmons, secretary; Roger Pierce, treasurer; Dr. James H. Wright, pathologist; Dr. William Duane, research fellow in physics; Dr. William T. Bovie, research fellow in biology; Dr. Henry Lyman, research fellow in chemistry; Dr. Ernest W. Goodpasture, research fellow in pathology.

The following physicians and surgeons have been appointed to the staff of the Huntington

Memorial Hospital for the coming year: Surgeons, Dr. Robert Greenough, Dr. Channing Simmons, and Dr. Edward H. Risley; assistant surgeon, Dr. George G. Smith; surgeon to outpatients, Dr. George A. Leland, Jr.; consulting physicians, Dr. Henry Christian and Dr. Francis W. Peabody; physician, Dr. George Minot; laryngologist, Dr. Daniel Greene; assistant physician, Dr. Arlie V. Boek.

**GIFT OF \$5,000 TO BROCKTON HOSPITAL.**—By the will of the late Edson B. Keith of Brockton, \$5,000 has been bequeathed to the Brockton Hospital.

**PREVENTION OF INDUSTRIAL DISEASE.**—The Massachusetts Board of Labor and Industries has appointed Dr. Wade Wright of Boston, who is now medical chief for the Red Cross in Poland, to take charge of the health conditions in industry throughout the state. Dr. Wright graduated from the Harvard Medical School in 1914, and since that time has been engaged in the study of industrial problems in connection with his work at the Massachusetts General Hospital, where he organized an industrial clinic. When the United States entered the war, he went to Europe with the Massachusetts General Hospital unit, but was later transferred by the Government to the American Red Cross. He is now acting as medical chief of the Red Cross for Poland and is devoting a large portion of his time to the study of reconstruction work for disabled soldiers. In February, he visited Warsaw and the Bolshevik and Ukrainian fronts for the purpose of investigating conditions there. Dr. Wright's work includes medical and general relief, sanitary operations, delousing and sterilization of clothes, civilian feeding, canteen service, and the distribution and sale of food. He has established a system of mobile relief units, consisting of doctors, nurses, aids, and military guards, in order to carry out the relief work. At the present time, his headquarters are at Bialystok.

Dr. Wright will leave Poland and take up his work for the Massachusetts Board of Labor and Industries about the first of August. His work will cover seventeen districts in the state. There are now twelve inspectors who will work under his direction, but it is probable that the number of inspectors will be increased.

## The Massachusetts Medical Society.

### PROCEEDINGS OF THE SOCIETY.

*First Day, June 3, 1919.*

CLINICS and demonstrations were held during the morning at the principal hospitals of Boston. All of the exercises of the anniversary were held at the Copley-Plaza Hotel, Boston, beginning with the annual meeting of the Supervisors June 3, at 11.30 a.m., followed by the annual meeting of the Council at noon, 116 Councilors being present. Meetings of the Sections of Medicine, Surgery, and Tuberculosis were held in the different halls of the building. A detailed and corrected program of the meetings and the officers of the Sections is to be found in the BOSTON MEDICAL AND SURGICAL JOURNAL for May 29, 1919, Vol. elxxx, pages 626, 627.

The following officers of the sections were elected by the sections for the ensuing year:

Section of Medicine: *Chairman*, Fresenius Van Nüys, Weston; *Secretary*, Lewis Webb Hill, Boston.

Section of Surgery: *Chairman*, Robert B. Greenough, Boston; *Secretary*, Irving J. Walker, Boston.

Section of Tuberculosis: *Chairman*, Henry D. Chadwick, Westfield; *Secretary*, E. O. Otis, Boston.

Section of Hospital Administration: *Chairman*, John T. Bottonley, Boston; *Secretary*, Stephen Rushmore, Boston.

The Council established a Section of Diseases of Children, June 3, 1919, and appointed these officers for the year 1919-1920: *Chairman*, John Lovett Morse, Boston; *Secretary*, J. Herbert Young, Newton.

The Shattuck Lecture was delivered in the evening by Dr. Francis G. Benedict of Boston on the topic: "Energy Requirements of Children from Birth to Puberty."

Following the lecture there was music, and refreshments were served in the ballroom.

*Second Day, June 4, 1919.*

The Society met at the Copley-Plaza Hotel for the exercises of the one hundred thirty-eighth anniversary. The President, Samuel B. Woodward, of Worcester, was in the chair and one hundred and fifty Fellows and guests were present during the morning. The minutes of the last meeting were read and accepted. The Secretary announced that during the past year the Society had lost by death 75 Fellows, by resignation 9 by deprivation of the privileges of fellowship 15, total loss 99. The Society had gained 100 Fellows as follows: restoration by the Council 8, readmitted by the Censors 5, new Fellows 87, total net gain 1, making the

membership of the Society, June 4, 1919, 3690.

The Secretary read the findings of the Board of Trial in the case of George Henry French as follows:

Boston, Nov. 20, 1918.

We, the Board of Trial duly appointed to consider the charges against George Henry French, of Somerville, for gross violation of the By-laws and Code of Ethics of the Society, and for conduct unworthy of an honorable physician, having met in accordance with appointment at the time and place specified, and having heard the evidence and seen and heard the accused in refutation of said charges, find that he is guilty of the charges.

And we do therefore adjudge and determine that said George Henry French be expelled from his membership of The Massachusetts Medical Society.

Board of Trial	{	E. S. BOLAND, <i>Chairman</i> .
		J. E. SIMPSON.
		A. G. GRIFFIN.
		M. V. PIERCE.
		F. H. THOMPSON, SR.

It was moved and seconded and unanimously voted that the findings of the Board of Trial be approved and that George Henry French be and he hereby is, expelled from his membership in the Massachusetts Medical Society, seventy-three persons being in the audience at the time the vote was taken.

Dr. F. G. Wheatley spoke of the organization of the Medical Veterans of the World War. He stated that he had some copies of the constitution and by-laws of this proposed organization and also application blanks which were to be filled out and sent to Col. F. F. Russell, M.C., U.S. Army, at Atlantic City, as soon as possible. The Secretary of the Society had a supply of blanks and would be glad to furnish them to any of the fellows or those who were entitled to join the organization; that he, Dr. Wheatley, had already sent blanks to the members of the draft boards in Massachusetts, and had published an account of the organization and a copy of the blank in the BOSTON MEDICAL AND SURGICAL JOURNAL of May 29, 1919.

The President introduced Dr. H. G. Anderson of Waterbury, Conn., and Dr. Freeman A. Tower of Derry, N. H., who brought the greetings of their respective state medical societies to the Massachusetts Medical Society.

Dr. Emily Clark-MacLeod spoke of the American Women's Hospitals associated under the National Women's Association for War Work by the 6000 women physicians who had been unable to serve actively in the ranks of the World War. She said that they had four hospitals in France, two in Serbia and one in the near East; the organization was affiliated with the Red Cross, had been approved by the Governments of the United States, France, Serbia and Greece; it had never spent 10% of the money collected. They are preparing to send two mobile hospitals into Serbia to assist the Serbian people. She would like to have the backing of the medical profession in the work that the women are doing.

The papers were read according to the program and were discussed by Dr. Lincoln Davis, Dr. Wyman Whittemore, and Dr. E. A. Codman.

At 12 o'clock noon the Annual Discourse was delivered by Dr. Samuel Crowell of Dorchester on the subject "The Reflections of a Physician Who Stayed at Home." The thanks of the Society were given to the orator by vote.

In the afternoon the Section of Hospital Administration met at the Hotel and listened to the papers on the program.

In the evening the Annual Dinner was served in the ballroom of the Copley-Plaza Hotel to 482 Fellows.

The President spoke on the need of medical men in the halls of legislation and introduced His Excellency Calvin Coolidge, Governor of the Commonwealth, Chief Justice Arthur P. Rugg of the Massachusetts Supreme Court, Rev. Thomas F. Davies of Springfield, Bishop of Western Massachusetts, and Dr. Joel E. Goldthwait of Boston, Colonel Medical Corps, United States Army, in charge of orthopedic and reconstruction work.

WALTER L. BUEBAGE,  
Secretary

#### ADMISSIONS REPORTED FROM JUNE 18, 1918, TO JUNE 4, 1919.

Year of Admission.	Name.	Residence.	Medical College.
1919	Alton, Benjamin Harrison, Worcester		11
1919	Anderson, Frank William, Roslindale		11
1919	Andrews, Sumner Chever, Cambridge		11
1919	Applebaum, Jacob, Dorchester		12
1919	Audet, Charles Henry, Lynn		32
1919	Baker, Horace Mitchell, Lowell		11
1919	Bell, José Penteado, Wayland		11
1919	Birdsall, Clarence Harlow, Haverhill		12
1919	Bottero, Giovanni Domenico, Brookline		18
1919	Boyd, James Francis, Brockton		12
1919	Brett, Adey Leonel, Boston		11
1918	Butler, Edmund John, Cambridge		11
1919	Calderwood, Edward Swazey, Roxbury		10
1918	Callanan, Francis Jervois, Boston		11
1918	Caruso, Septimio, Medford		12
1919	Church, Charles Noble, Worcester		22
1919	Coates, Everett Walton, Fitchburg		10
1919	Coffin, Whitman King, Boston		11
1918	Colmes, Abraham, Roxbury		10
1919	Conlin, Matthew George, Worcester		32
1919	Crabtree, Harvard Hersey, Roxbury		11
1918	Crawford, Lawrence Pears, Wollaston		45
1919	Cunningham, Thomas Patrick, Worcester		12
1918	Daland, Ernest Merrill, Boston		11
1919	Downing, John Godwin, South Boston		11
1919	Drake, Wallace Horne, North Weymouth		11
1919	Duffy, James Joseph, Webster		11
1919	Dushan, Samuel Sidney, Salem		12
1919	Ellis, Ralph Warner, Worcester		11
1919	*Encheuske, Claës Julius, Cambridge		11
1919	Fein, Harry, Roxbury		11
1919	Feldman, Louis, Boston		12
1919	Fluck, Harry Paul, East Boston		11
1919	Fremont-Smith, Frank, Boston		19
1919	Gangemi, Michael Angelo, North Adams		12
1919	Goddard, Fred Chambers, Newtonville		12
1919	Greenberg, Boris Efim, Roxbury		12
1919	Hanon, Joseph Peter, Hudson		8
1919	Hiebert, Daniel Howard, Provincetown		10
1919	Hoover, Clayton Elvin, Fitchburg		10

\* Readmitted by Censors.

Year of Admission.	Name.	Residence.	Medical College.
1919	Horr, Albert Winslow, Malden		10
1919	Hutchinson, Charles William, Concord		11
1919	Hyman, Albert Solomon, Boston		11
1919	Jackson, George Henry, Plymouth		11
1918	Janjigian, Robert Rupen, St. Elizabeth's Hospital		10
1919	*Jellalian, Hairabad S., Watertown		12
1919	Jones, Frank Leslie, Chatham		10
1919	Kinne, Arthur Lyman, Holyoke		6
1919	Kurth, Harold Richard, Lawrence		11
1919	Lapham, George Nelson, Rutland		10
1919	Leib, Edwin Roy, Worcester		10
1919	Leland, Leslie Phillips, Worcester		10
1919	MacLean, Donald John, Palmer		20
1919	McChure, Charles Walter, Boston		46
1919	McCruden, Francis Henry, Boston		11
1919	McGrath, John Edward, Hudson		11
1919	McLaughlin, James Francis, Springfield		12
1918	Messler, Adolr Eugene, Worcester		12
1919	Meunier, Raymond Royale, Springfield		12
1918	Moir, Marguerite Winifred, Brookline		10
1918	Morris, Abraham Samuel, Haverhill		10
1919	*Myers, Edmund, Boston		38
1919	*Myerson, Abraham, Dorchester		12
1919	Neill, Roberta Estella, Springfield		12
1918	Nesmith, Francis Marion, Monson		17
1919	O'Connor, Alfred Smith, Worcester		12
1919	O'Hara, Francis James, North Adams		4
1919	Olds, Frank William, Williamstown		17
1918	Osgood, Herman Ashton, Boston		11
1919	Paize, Willbur Myrtland, Lynn		12
1918	Parmenter, Berrie Choate, East Gloucester		11
1919	Peterson, Arthur Fredolf, Brockton		32
1919	Phaneuf, Josephat Stanislas Policarpe, Brockton		20
1919	Powell, Charles Austin, Boston		10
1919	Resnik, Joseph, Dorchester		12
1918	Ricker, Carroll Henry, Worcester		12
1918	Ring, Arthur Joseph, Worcester		12
1919	Rockwood, Ethel May, Worcester		6
1919	Sawyer, Edward Julius, Gardner		12
1918	Schubmehl, Frank Edward, Lynn		10
1919	Schwager, Solomon, Pittsfield		30
1919	Shafer, Rudolf Jonas, Lowell		12
1919	Simmons, Hugh Ludwig, Worcester		12
1918	Steffen, Anna Elizabeth, Long Island Hospital, Boston Harbor		12
1918	*Stone, Ella Gertrude, Boston		12
1919	Van Gansbeck, Harold, Chicopee Falls		12
1919	Vershbow, Nathan, Lowell		12
1919	Ward, John Clement, Worcester		12
1919	Wetherell, Bryant Davis, Boston		11
1919	Wheeler, William Davidson, Revere		12
1919	Woodward, William Creighton, Boston		4
1919	Wright, Charles Wadsworth, North Adams		30

Total, 87+5=92.

#### KEY TO MEDICAL COLLEGES.

- 4 Georgetown University School of Medicine.
- 6 Johns Hopkins University, Medical Department.
- 7 College of Physicians and Surgeons, Baltimore, Md.
- 8 Baltimore Medical College.
- 10 Boston University School of Medicine.
- 11 Medical School of Harvard University.
- 12 Tufts College Medical School.
- 17 Columbia University College of Physicians and Surgeons.
- 18 Royal University of Genoa, Italy.
- 19 University of Pennsylvania, Department of Medicine.
- 20 College of Physicians and Surgeons, Boston.
- 22 University of Vermont College of Medicine.
- 30 New York University and Bellevue Hospital Medical College.
- 32 University of Maryland School of Medicine.
- 38 Jefferson Medical College.
- 45 Rush Medical College.
- 46 Starling, Ohio, Medical College.

\* Readmitted by Censors.

## DEATHS REPORTED FROM JUNE 18, 1918, TO JUNE 4, 1919

Admitted.	Name.	Place of Death.	Date of Death.	Age.
1867	†Ahearn, Cornelius Augustus	Lynn	Apr. 17, 1919.	78
1915	Albee, Kenneth Field	Weston	Sept. 24, 1918.	32
1869	†Bassett, Elton James	Taunton	March 16, 1919.	74
1903	Beal, Howard Walter	Paris, France	July 20, 1918.	49
1808	Blake, Clarence John	Boston	Jan. 29, 1919.	75
1906	Bosworth, Freeman Dodd	Brookline	June 2, 1919.	43
1886	Buckley, Philip Townsend	South Boston	Sept. 19, 1918.	58
1897	Butler, William Hodnett	Fall River	Oct. 11, 1918.	51
1916	Caro, Helman	Mons, France	Jan. 22, 1919.	29
1914	Carroll, Michael James	Newport, R. I.	Sept. 29, 1918.	36
1872	Chamberlain, Myron Levi	Boston	Feb. 13, 1919.	74
1902	Chase, Walter Greenough	Boston	Jan. 27, 1919.	59
1876	†Chipman, William Reginald	Chelsea	Oct. 7, 1918.	69
1895	Cleaves, Frederick Henry	Brookline	Aug. 19, 1918.	54
1905	Cooley, Abbot Lathrop	Chicopee Falls	Oct. 28, 1918.	60
1895	Couillard, Pierre Leonard	Manchaug	Oct. 11, 1918.	68
1914	Courtney, Thomas Joseph	Norfolk, Va.	Dec. 27, 1918.	29
1901	Cowles, Frederick Waterman	West Brookfield	Oct. 15, 1918.	52
1987	Crossman, Frank Albert	Dorchester	Aug. 5, 1918.	59
1902	Cutter, Arthur Hardy	Methuen	Oct. 4, 1918.	45
1892	Day, Clarence Currier	Newburyport	Oct. 17, 1918.	52
1893	Dearing, Henry Lincoln	Braintree	Dec. 30, 1918.	52
1917	Dennett, Paul Carroll	France	Oct. 11, 1918.	26
1909	Denning, Frederic Joseph	Boston	Sept. 17, 1918.	33
1899	Dole, Charles Frederick	Sharon	March 25, 1918.	43
1896	Dwight, Henry Leonard	Dartmouth	Sept. 16, 1916.	56
1915	Emery, William Edward	Ft. Oglethorpe, Ga.	June 11, 1918.	28
1907	Finegan, Daniel Joseph	Gloucester	June 15, 1918.	49
1897	Frost, Edward Clayton	New York, N. Y.	May 15, 1919.	61
1888	Gallison, Ambrose John	Franklin	Feb. 13, 1918.	61
1907	Giblin, Francis Joseph	Dorchester	April 13, 1919.	51
1898	Gilbert, Louis Whitmore	Brookline	March 30, 1919.	47
1888	Gould, Clarke Storer	Roxbury	March 28, 1919.	54
1855	†Green, Samuel Abbott	Boston	Dec. 5, 1918.	88
1912	Hamblen, Edward Everett	Bedford	Nov. 9, 1918.	53
1889	Harrington, Thomas Francis	Boston	Jan. 19, 1919.	52
1893	Hassett, John Joseph	Lee	Oct. 11, 1918.	56
1883	Heath, Joseph Webster	Wakefield	May 15, 1919.	65
1895	Hills, Frederick Lyman	New York, N. Y.	July 30, 1918.	47
1897	Holmes, Edgar Miller	Allerton	Sept. 19, 1918.	50
1902	Holmes Howard Fowler	Cambridge	May 22, 1919.	48
1917	Hudson, Carl Bibb	France	Oct. 2, 1918.	30
1903	Jackson, Howard Bigelow	Ft. Oglethorpe, Ga.	Oct. 13, 1918.	44
1891	Jackson, James Marsh	Boston	Dec. 27, 1918.	54
1907	Jones, Everett	Brookline	April 25, 1919.	50
1906	Kingsbury, Walter Warren	Malden	Sept. 15, 1918.	44
1904	Kirby, James Richard	Clinton	Sept. 29, 1918.	41
1894	Laue, Francis Augustus	East Lynn	Oct. 29, 1918.	51
1906	Lawlor, Richard Henry	Methuen	Feb. 12, 1919.	47
1901	Leen, Thomas Francis	South Boston	Sept. 16, 1918.	43
1905	MacCormick, John Alan	Boston	Feb. 16, 1919.	46
1879	MacKeen, Alfred Awater	Whitman	Jan. 18, 1919.	65
1907	McGurn, William J.	Roxbury	March 19, 1918.	46
1916	Morriss, William Sarsfield	Fall River	Oct. 11, 1918.	29
1893	O'Keefe, Michael Wallace	East Boston	July 16, 1918.	67
1896	Ordway, Charles Anthony	Everett	Sept. 24, 1918.	44
1864	Paige, Nomus	Taunton	April 16, 1919.	79
1907	Perkins, Thomas Fomge	Cliftondale	Dec. 6, 1918.	44
1912	Phelan, Edward Francis	France	Dec. 9, 1918.	32
1879	Plimpton, Lewis Henry	Boston	Feb. 21, 1919.	66
1870	Putnam, James Jackson	Boston	Nov. 4, 1918.	72
1914	Ryder, Walter Irenaeus	South Boston	Sept. 24, 1918.	29
1917	Salvin, Louis Wilton	Roxbury	Sept. 25, 1918.	31
1892	Savin, Robert Valentine	Storrs, Ct.	Jan. 19, 1919.	62
1876	Somers, John Edward	Boston	July 4, 1918.	66
1899	Stevens, Ralph Emerson	Marlboro	Sept. 18, 1918.	59
1880	†Stuart, James Henry	Brighton	July 17, 1918.	67
1882	Taylor, Frederic Weston	Cambridge	Jan. 21, 1919.	62
1917	Towle, Fred Sentes	Colonia, N. J.	Oct. 9, 1918.	54
1901	Uppihart, John Edwin	Ashfield	June 14, 1918.	58
1906	Walcott, William Wright	France	March 16, 1919.	79
1878	Wells, Frank	Boston	March 4, 1919.	70
1906	Wells, Orion Cassar	Westford	Oct. 4, 1918.	38
1914	White, Everett	Lynn	Feb. 27, 1919.	48
1872	†Williams, Edward Tufts	Boston	Aug. 5, 1918.	73

† Retired Fellow.

Total, 75 Deaths.

## OFFICERS OF THE MASSACHUSETTS MEDICAL SOCIETY.

Chosen by the Council, June 3, 1919.

Alfred Worcester, Waltham, President.  
 Arthur R. Crandell, Taunton, Vice-President.  
 Walter L. Burrage, Jamaica Plain, Secretary.  
 Arthur K. Stone, Framingham Center, Treasurer.  
 Edwin H. Brigham, Brookline, Librarian.

## STANDING COMMITTEES.

Of Arrangements.—R. H. Miller, C. H. Lawrence, Jr., Donald Macomber, A. W. Reggio, J. B. Swift, K. G. Percy.

On Publications and Scientific Papers.—E. W. Taylor, R. B. Osgood, F. T. Lord, R. M. Green, A. C. Getchell.

On Membership and Finance.—C. M. Green, Algonon Coolidge, Jr., Samuel Crowell, Gilman Osgood, Homer Gage.

On Ethics and Discipline.—J. W. Bartol, Henry Jackson, T. J. Robinson, David Cheever, F. W. Anthony.

On Medical Education and Medical Diplomas.—Channing Frothingham, C. F. Painter, J. F. Burnham, A. G. Howard, R. L. DeNormandie.

On State and National Legislation.—Alfred Worcester, F. G. Wheatley, E. H. Stevens, J. S. Stone, A. R. Crandell.

On Public Health.—E. H. Bigelow, Annie L. Hamilton, E. F. Cody, Victor Safford, R. I. Lee.

## PRESIDENTS OF DISTRICT MEDICAL SOCIETIES.

Vice-Presidents (*Ex-officio*).

Arranged according to seniority of fellowship in the Massachusetts Medical Society.

W. J. Delahanty	.....	Worcester
J. O'Sullivan	.....	Essex North
J. B. Blake	.....	Suffolk
J. H. Nichols	.....	Middlesex North
Joseph Frame	.....	Plymouth
H. T. Baldwin	.....	Middlesex South
J. A. Barré	.....	Bristol South
A. L. Damon	.....	Hampden
F. P. Denny	.....	Norfolk
R. D. Perley	.....	Middlesex East
W. F. Iobie	.....	Worcester North
E. H. Bushnell	.....	Norfolk South
H. G. Rockwell	.....	Hampshire
B. H. Taylor	.....	Berkshire
E. A. Binford	.....	Barstable
Charles Moline	.....	Franklin
H. G. Ripley	.....	Bristol North
W. T. Hopkins	.....	Essex South

## COUNCILORS, 1919-1920.

NOTE.—The initials M. N. C., following the name of a councilor, indicate that he is a member of the Nominating Committee. V.P. indicates that a member is a councilor by virtue of his office of president of a district society, and so vice-president of the general society. C. indicates that he is chairman of a Standing Committee. Ex-P. indicates ex-president.

## BARNSTABLE.

F. A. Binford, V.P., Hyannis.  
 E. F. Curry, Sagamore.  
 W. D. Kinney, Osterville.  
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 A. C. Lewis, Fall River.  
 A. H. Mandell, New Bedford.

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 T. S. Bacon, Springfield.  
 E. P. Bagg, Jr., Holyoke.  
 F. T. Clark, Westfield.  
 Helen T. Cleaves, Palmer.  
 A. J. Douglas, Westfield.  
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 A. W. Dudley, Cambridge.  
 John Duff, Charlestown.  
 W. E. Fernald, Waverley.  
 G. W. Gay, Ex.P., Chestnut Hill.  
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 A. A. Jackson, Everett.  
 S. R. Lancaster, Cambridge.  
 C. E. Monzan, Somerville.  
 B. M. Pierce, Cambridge.  
 W. A. Putnam, Cambridge.  
 P. W. Rice, Brighton.  
 W. D. Ruston, West Somerville.  
 Godfrey Ryder, Malden.  
 L. F. Sise, Medford.  
 C. H. Staples, Malden.  
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 F. R. Stubbs, Newton.  
 H. P. Walcott, Ex.P., Cambridge.  
 Fresenius Van Nijys, Weston.  
 G. L. West, Newton Center.  
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 Alfred Worcester, Pres., Waltham.

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 W. H. Bennett, Hyde Park.  
 D. N. Blakely, Brookline.  
 E. H. Brigham, Libran., Brookline.  
 A. N. Broughton, M.N.C., Jamaica Plain.  
 W. L. Burrage, Sec., Jamaica Plain.  
 G. W. Clement, Roxbury.  
 M. J. Cronin, Roxbury.  
 Samuel Crowell, Dorchester.  
 H. W. Dana, Brookline.  
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 W. C. Emery, Dorchester.  
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 H. T. Holland, Jamaica Plain.  
 G. W. Kaan, Brookline.  
 Bradford Kent, Dorchester.  
 P. P. McCarthy, Milton.  
 E. F. Murphy, Roxbury.  
 D. T. O'Keefe, Jamaica Plain.  
 W. H. Parker, Dorchester.  
 A. P. Perry, Jamaica Plain.  
 M. V. Pierce, Milton.  
 H. H. Powers, Brookline.  
 S. H. Rubin, Roxbury.  
 R. D. Schmidt, Milton.  
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## NORFOLK SOUTH.

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 F. J. Cotton, Boston.  
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 E. A. Crockett, Boston.  
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 E. J. Cummins, Boston.  
 E. G. Cutler, Boston.  
 Lincoln Davis, Boston.  
 W. E. Faulkner, Boston.  
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 G. S. Hill, Boston.  
 J. C. Hubbard, Boston.  
 F. L. Jack, Boston.  
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 E. A. Locke, Boston.  
 H. B. Loder, Boston.  
 F. T. Lord, Boston.  
 R. W. Lovett, M.N.C., Boston.  
 R. H. Miller, C., Boston.  
 W. A. Morrison, East Boston.  
 F. S. Newell, Boston.  
 E. H. Nichols, Boston.  
 B. W. Pond, Boston.  
 Abner Post, Boston.  
 Stephen Rushmore, Boston.  
 G. G. Sears, Boston.  
 G. B. Shattuck, Ex.P., Boston.  
 G. G. Smith, Boston.  
 P. M. Smith, Boston.  
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 E. W. Taylor, C., Boston.  
 Beth Vincent, Boston.  
 D. H. Walker, Boston.  
 G. A. Waterman, Boston.

## WORCESTER.

W. J. Delahanty, V.P., Worcester.  
 F. H. Baker, Worcester.  
 W. P. Bowers, Ex.P., Clinton.  
 F. H. Clapp, North Grafton.  
 J. T. Duggan, Worcester.  
 M. F. Fallon, Worcester.  
 Homer Gage, Worcester.  
 J. O. Gendreau, Webster.  
 R. W. Greene, Worcester.  
 David Harrower, M.N.C., Worcester.  
 E. L. Hunt, Worcester.  
 A. G. Hurd, Millbury.  
 W. L. Johnson, Uxbridge.  
 G. O. Ward, Worcester.  
 F. H. Washburn, Holden.  
 C. D. Wheeler, Worcester.  
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 E. L. Fiske, M.N.C., Fitchburg.  
 J. G. Henry, Winchendon.  
 A. P. Mason, Fitchburg.  
 W. F. Sawyer, Fitchburg.

## CENSORS, 1919-1920.

## BARNSTABLE.

J. P. Nickerson, Supervisor, West Harwich.  
 E. E. Hawes, Hyannis.  
 J. H. Higgins, Marston Mills.  
 E. E. Harris, Hyannis.  
 E. S. Osborne, Harwich.

## BERKSHIRE.

Henry Colt, Supervisor, Pittsfield.  
 C. H. Richardson, Pittsfield.  
 A. C. England, Pittsfield.  
 J. T. Crowley, Adams.  
 E. W. Markham, Lee.



## BRISTOL NORTH,

F. A. Hubbard, Supervisor, Taunton.  
H. B. Baker, Taunton.  
T. F. Clark, Taunton.  
A. R. Crandell, Taunton.  
T. J. Robinson, Taunton.

## BRISTOL SOUTH,

W. A. Dolan, Supervisor, Fall River.  
W. E. Blaine, Mattapoisett.  
W. T. Learned, Fall River.  
C. J. Leary, New Bedford.  
S. V. Merritt, Fall River.

## ESSEX NORTH,

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A. M. Hubbell, Haverhill.  
J. E. Bryant, Haverhill.  
R. C. Hurd, Newburyport.  
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## ESSEX SOUTH,

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J. F. Donaldson, Salem.  
A. T. Hawes, Lynn.  
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C. L. Upton, Shelburne Falls.  
G. P. Twitchell, Greenfield.  
C. C. Messer, Turners Falls.

## HAMPDEN,

G. L. Taylor, Supervisor, Holyoke.  
M. W. Harrington, Indian Orchard.  
F. B. Sweet, Springfield.  
E. L. Davis, Springfield.  
J. J. Carroll, Holyoke.

## HAMPSHIRE,

A. G. Minshall, Supervisor, Northampton.  
S. A. Clark, Northampton.  
J. J. Hayes, Williamsburg.  
N. C. Haskell, Amherst.  
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R. R. Stratton, Melrose.  
F. T. Woodbury, Wakefield.  
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## MIDDLESEX NORTH,

J. H. Lambert, Supervisor, Lowell.  
E. J. Clark, Lowell.  
J. P. McAdams, Lowell.  
G. A. Lavallee, Lowell.  
J. A. Gage, Lowell.

## MIDDLESEX SOUTH,

C. E. Hills, Supervisor, So. Natick.  
F. J. Goodridge, Cambridge.  
C. B. Fuller, Waltham.  
F. G. Smith, Somerville.  
I. J. Fisher, West Newton.

## NORFOLK,

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W. J. Walton, Dorchester.  
B. S. Blanchard, Brookline.  
C. F. Stack, Hyde Park.  
E. T. Rollins, Jamaica Plain.

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E. R. Dams, Braintree.  
V. M. Tirrell, South Weymouth.  
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## PLYMOUTH,

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J. H. Drohan, Brockton.  
W. W. Fullerton, Brockton.  
E. J. Beaulieu, Whitman.  
R. B. Rand, North Abington.

## SUFFOLK,

Stephen Rushmore, Supervisor, Boston.  
C. M. Smith, Boston.  
C. N. Cutler, Chelsea.  
T. J. O'Brien, Boston.  
J. S. Stone, Boston.

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W. H. Rose, Worcester.  
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Alexander McNeish, Leicester.  
A. E. O'Connell, Worcester.

## WORCESTER NORTH,

A. P. Mason, Supervisor, Fitchburg.  
G. P. Norton, Fitchburg.  
C. H. Jennings, Fitchburg.  
H. R. Nye, Leominster.  
C. S. Brigham, Leominster.

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1919-1920.

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BRISTOL NORTH, C. S. Holden, Attleboro.  
BRISTOL SOUTH, W. E. Synan, Fall River.  
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PLYMOUTH, Gilman Osgood, Rockland.  
SUFFOLK, John Bartol, Boston.  
WORCESTER, G. F. O'Day, Worcester.  
WORCESTER NORTH, F. H. Thompson, Sr., Fitchburg.

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Elected by the District Medical Societies.

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MIDDLESEX EAST.—R. D. Perley, Melrose, President; C. L. Sopher, Wakefield, Vice-President; A. E. Small, Melrose, Secretary; Richard Dutton, Wakefield, Treasurer; G. W. Nickerson, Stoughton, Librarian.

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## Obituary.

### LEWIS MERRITT PALMER, M.D.

The death of Lewis Merritt Palmer, M.D., is deeply regretted by the medical profession and by many families and individuals to whom he had rendered efficient and faithful service throughout his life.

Dr. Palmer died of pulmonary embolism at the Framingham Hospital on June 4, 1919, at the age of sixty-eight years. He was born in Litchfield, Maine, on September 21, 1850. He graduated from Bates College in 1875 and from Harvard Medical School in 1881. For a while

he served as resident physician at the Rhode Island Hospital, and later established a practice in South Framingham in 1882, specializing in diseases of the eye, ear, and throat. He served on the staff of the Framingham Hospital, and it was partly through his efforts that a training school for nurses was inaugurated. For ten years, Dr. Palmer has been a member of the Trustees of the Massachusetts Training Schools. He was a member of the Massachusetts Medical Society, the American Medical Association, and the Massachusetts Medical Association of Boards of Health. At the time of his death he was medical examiner in the Eighth Middlesex District. In 1909, he was made president of the Middlesex South District Medical Society. He had been acting surgeon at the Sherborn Reformatory, and assisted in the organization of a local Anti-Tuberculosis Society, of which he was president.

Dr. Palmer married Miss Nellie B. Prouty of Newport, Vermont, in 1882. His wife and two daughters survive him.

The life of Dr. Palmer has been characterized by constant devotion and active service to his fellow men, for whom his memory will always remain a precious heritage.

## RECENT DEATHS.

DR. EDWARD LINDEMAN of New York was drowned on June 11, while bathing in the surf at Atlantic City. Dr. Lindeman was graduated from Yale University and Johns Hopkins College. In 1908 he began practice in New York, and served as resident physician of the children's medical service of Bellevue Hospital. Dr. Lindeman originated the syringe cannula method of blood transfusion, which took the place of the older method of supplying blood directly from the arteries of one person to the veins of another.

DR. ARTHUR BRIGHAM NORTON died at his home in New York on June 18. His death was caused by heart disease following an attack of pneumonia. Dr. Norton was born in Marlboro in 1856. He was a graduate of the New York Homeopathic Medical College and Hospital, where he later became professor of ophthalmology. For thirty-five years he served as chief surgeon at the New York Ophthalmological Hospital. He was the author of several medical works and had served as president of the American Institute of Homeopathy, the National Society of Electro-Therapeutics, and New York State and New York County Homeopathic Medical Societies.

DR. JOHN RUGGLES GREENLEAF, a retired Fellow of the Massachusetts Medical Society, died at his home in Gardner, June 8, 1919, aged 78 years.

# The Boston Medical and Surgical Journal

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## Address.

### MEDICINE FROM THE LAY STANDPOINT. MOLIÈRE: SHAW: KIPLING.\*

By TIMOTHY LEARY, M.D., BOSTON.

"O wad some Pow'r the giftie gie us  
To see ourselves as ithers see us."

Medicine, the mother of the natural sciences, had grown with the growth of human knowledge, and had retrogressed with its decadence into an affectation of learning, when Molière, with his genius for observation and his pitiless ridicule for shams, constituted himself the first great lay critic of the healing art.

Medicine had fallen on evil days. Science was just awakening from its long sleep of fourteen centuries. The written word contained all knowledge. The search for truth was pursued not by questioning natural phenomena directly, but by determining what the teachers taught on the subject. Investigation had been replaced by philosophical interpretation of what was written by the masters. The conditions which existed in medicine, then, were analogous to those which obtain in the law today. Common sense and fact and sometimes justice are compelled to give way to precedent and the author-

ity of the dead hand, while the world waits in breathless awe the momentous decision which shall determine the fate of a semi-colon.

The fame of the little great men of Molière's day rested on the composing of elysters, purges or emetics of unbelievable complexity, containing, oftentimes, scores of ingredients; on erudite dissertations of inflated verbosity acclaiming the authority of Galen, whose works had been the medical Bible since the second century, and condemning the new theory of the circulation of the blood, advanced by that medical heretic Harvey; on disputations, attributing to this or that remedy marvelous properties, with conclusions based, not on experience, but upon pedagogical phraseology and misapplied quotations from Hippocrates.

The charlatanism of Paracelsus, the founder of pharmacology, had transmitted itself to his followers, who held public debates on the virtues of their remedies. "The public had attended with amusement the discussions on the emetic wine, and had laughed at the factums launched by the faculties of Rouen and Marseilles against the apothecaries of these two cities. The comedy, so to speak, arranged itself. Molière had but to set the scene." The situation justified the verse of the time:

What are doctors made of?

\* Address delivered to the Graduating Class, Tufts College Medical School, March 5, 1919

An affected air pedantic,  
With sputtered Greek and Latin,  
A long perruque and grotesque robes  
Fashioned of fur and satin."

That's what doctors are made of.

"Molière, who pursued without mercy the pedants of all classes and all shades, both the charlatans of learning and the charlatans of *virtu*, had only to choose his types."

In the consultation of Guenaut, Desfongerais, Brayer, and Valot, at the death bed of Mazarin, one of them insisted that the cardinal was suffering from disease of the liver; a second, that his mesentery was at fault; a third, that his spleen was the essentially diseased organ; the fourth, that it was the lungs which were responsible for his condition; and the dispute, as was the custom of the times, was aired before the public.

The picture of a consultation of four learned physicians, suggested by this incident, and presented in "L'Amour Médecin," satirizes the vain ceremonial and pretensions verbiage which dominated the activities of the profession. Monsieur Tomès is made to say: "A dead man is only a dead man, and of no consequence; but a neglected formality is a matter of serious moment to the whole corps of physicians." Substitute lawyers for physicians and the sentiment might have been uttered yesterday, particularly with reference to recent courts-martial.

The consultation deals with a young girl, who is pretending illness for the purpose of delaying a marriage, which her father had arranged against her wishes. In the report of the results of their conference to her father, the following is a rough translation of the dialogue, Macrotin speaking for the most part, in an affected drawl: "Monsieur, in matters of this character it is necessary to proceed with circumspection; to do nothing, so to speak, in a hurry; since the harm that can be done may be, according to our master Hippocrates, of dangerous consequence . . . *experimentum periculosum* . . . To come to the point, I find that your daughter has a chronic disease, which can endanger her life if she is not given aid, inasmuch as the symptoms which she has are indicative of a fuliginous and mordicant vapor, which is attacking the membranes of the brain. This vapor, which we call in Greek *atmos*, is caused by the tenacious and conglutinous putrid humors, which are contained in

the lower abdomen. And since these humors have been engendered over a long period of time, they have entered into combination, and have acquired this malignancy which is extending toward the region of the brain. So in order to remove, to detach, to pluck out, to expel, to evacuate the said humors, a vigorous purgation is necessary. But as a preliminary, I find it pertinent, and there are no disadvantages, to use some little anodine remedies, that is to say, some little remollient and detersive cleansing agents—some juleps and refreshing syrups which we will mix with her ptisan (barley-water). Afterwards we will come to the purgation and to the bleeding, which we will repeat, if necessary. We cannot promise, with all this, that your daughter will not die. But at least you will have done something, and you will have the consolation that she will have died according to the proper forms. It is better to die according to the rules than to recover in contravention of the rules."

As Dryden has said:

"Satire has always shone among the rest,  
And is the boldest way, if not the best,  
To tell men freely of their foulest faults,  
To laugh at their vain deeds and vainer  
thoughts."

And yet the satire of Molière had little influence in changing the manners and methods of those he reprobated, probably because the whole world of learning, and not medicine alone, was tarred with the same stick, and stilted verbiage covered a morass of amazing misinformation.

The criticism of Molière was not constructive. The shafts of his ridicule could puncture the pompous pretensions of the doctors of the court, but he had nothing to offer in their stead. His was the negation of the agnostic. To quote Beralde—"The mainsprings of our being are mysteries, up to now, which the human mind cannot penetrate." To recover from illness, "it is requisite only to remain at rest. Nature, when we permit her, will withdraw herself gently from the disorder into which she has fallen. It is our restlessness, our impatience, which spoils everything."\*

The purging of the profession of its affecta-

\* Molière, suffering from tuberculosis of the lungs, died as the result of pulmonary hemorrhage following the fourth production of "La Malade Imaginaire," his most famous antidiversion against medicine. It is an interesting thought that the toxins of the tubercle bacillus may have fed the fires of his genius, as they are thought to have stimulated the powers of Stevenson.

tions and pretensions came from within. Vesalius had revolted from the authority of Galen, and had had the temerity to teach anatomy from the open book of the dissected body; to describe things as they actually were, rather than as Galen said they should be. Harvey had discovered the circulation of blood, and his teachings were spreading, despite the anathemas of the defenders of constituted authority.

Aselli had described the lacteals; Malpighi had brought the microscope to the aid of the growing science, and had begun to lay bare the structure of the glandular organs, which Bellini, Steno, De Graaf, Peyer and Brunner were to further elucidate within a few years. Boerhaave was shortly to be born, and, with his illustrious pupil Haller, was to put on a scientific basis the study of the new physiology, which had emerged, modified by Van Helmont, Sylvius and the English School, from the alchemy of Paracelsus.

Morgagni was to establish the new branch of pathological anatomy. Hunter was to found experimental research, and Jenner was to institute specific prophylaxis. And so, through the following century to the time, little over a generation ago, when the work of Pasteur and Koch firmly grounded scientific medicine on a basis of specific etiology, and made it as exact a science as anything dealing with living things can be at the moment. With the substitution of the laboratory for the library, the last symbols of the charlatanism inherited from the time of Molière have disappeared, through the elimination of the chimney-pot hat, the frock coat and the gold headed cane as the necessary equipment of the doctor, and their replacement by the blood-pressure apparatus, the blood-counter and the culture tube.

If Molière were alive today he would have little to complain of in a profession whose watchwords are observation, experience and experiment.

Although we might escape the ridicule of a Molière, we have not progressed to the point where we can hope to evade the satire of a Shaw.

In characteristic vein, Shaw, in the preface to "The Doctor's Dilemma," wades through ninety-seven pages of diatribe against medicine as it is practiced, based on his familiar, philosophically defensible thesis, that "whatever is,

is wrong." Many of his conclusions are founded on half truths or near truths, and others on sturdy lying (the phrase is his), on prejudice (he is a super antivivisectionist, and on a misunderstanding of medical facts, not remarkable in even so brilliant a layman as Shaw. His strictures are based upon medical practice in England, but his criticisms are evidently intended to apply to medical practice at large. The plot of the play rotates about Sir A. E. Wright's opsonic theory and particularly his negative phase, which experienced workers in vaccine therapy have come to recognize as a negligible factor in most cases. As in many of the Shaw productions, the preface is more revealing than the play.

The philosophy of Shaw is that of a socialistic superman, who believes himself all-seeing and all-knowing, and who takes a bird's-eye view of humanity from an elevation, as a biologist might look down on a pen of guinea pigs; who has satisfied himself that these human animals show certain distinctive traits, which are so constant that he can formulate curves of their reactions under stress, as the physicist can plot the curves of flight of a moving body, if he knows the forces which are acting. From his superman's standpoint men are selfish, cruel, liars and fools; and since he is an extremist and delights in generalizations, all men are selfish, cruel, liars and fools. The words unselfishness, kindness, truth, honor and wisdom seem in some manner to have been excluded from his dictionary, or are defined in terms which twist and distort their meanings out of all semblance to our conception of them. Altruism does not exist for him; self interest is always the governing motive.

When he starts out with the announcement that "the medical service of the community, as at present provided for, is a murderous absurdity," one is inclined to take him seriously, and become indignant, until he suddenly leans up at one from the page, with his tongue in his cheek, and one is reminded that a most efficient means of attracting and holding a man's attention is to abuse him soundly. With reference to the doctors, he condescends to agree that, "Up to a certain point doctors, like carpenters and masons, must earn their living by doing the work that the public wants from them; and as it is not in the nature of things possible that such public want should be based on unmixed

disutility, it may be admitted that doctors have their uses, real as well as imaginary." This, like many of Shaw's lucubrations, reminds one of an ingenuous philosopher of Molière's period, who has just discovered that two and two make four. And he continues, blandly ignoring the glorious record which led President Eliot to characterize the profession as thoroughly altruistic, beneficent and self-sacrificing: "But just as the best carpenter and mason will resist the introduction of a machine that is likely to throw him out of work, or the public technical education of unskilled laborer's sons to compete with him, so the doctor will resist with all his powers of persecution every advance of science which threatens his income." Therefore, . . . "it unluckily happens that the organization of private practitioners, which we call the medical profession, is coming more and more to represent, not science, but desperate and embittered antisience."

That the profession must favor dismemberment or evisceration is one of his conclusions, since we are paid for operations which dismember or eviscerate, and self interest should cause us to perform such operations unnecessarily. He discredits the nobility of our profession and the high character and honor of its members, because (*he accuses*) we practice cruelty in the search of knowledge and reassure the public in this respect "with lies of breath-bereaving brazenness." As for consciences, "Doctors are just like other Englishmen: most of them have no honor and no conscience: what they commonly mistake for these is sentimentality and an intense dread of doing anything that everybody else does not do, or omitting to do anything that anybody else does."

Over one-fourth of his argument deals with vivisection, and since he is a strict vegetarian and abhors sport, he unites the doctors with the antivivisectionists, "whose daily habits and fashionable amusements cause more suffering in a week, than all the vivisectioners of Europe do in a year," in a denunciation which exhausts the Shavian vocabulary. He would strain at a mouse and swallow a baby, as is evidenced in the eleventh of his health commandments: "In legislation and social organization, proceed on the principle that invalids, meaning persons who cannot keep themselves alive by their own activities, cannot, beyond reason, expect to be kept alive by the activities of others . . .

The theory that every individual alive is of infinite value is legislatively impracticable . .

. . . The man who costs more than he is worth, is doomed by sound hygiene as inexorably as by sound economics,"—a truly Spartan attitude toward man, but not to be adopted under any circumstances toward the sacred guinea-pig.

As the East Indian magician plants an actual seed in the sand, and makes one see growing from it a great tree, whose branches are lost in the clouds, so Shaw takes a kernel of truth and causes to appear a wordy upas tree of fiction, with just enough fact among the branches to make its semblance real to the uninitiate. Listen to him on "Bacteriology as a superstition." "Wise men used to take care to consult doctors qualified before 1860, who were usually contemptuous of or indifferent to the germ theory and bacteriological therapeutics, but now that these veterans have mostly retired or died, we are left in the hands of the generations, which, having heard of microbes, much as St. Thomas Aquinas heard of angels, suddenly concluded that the whole art of healing could be summed up in the formula: Find the microbe and kill it. And even that they do not know how to do. The simplest way to kill most microbes is to throw them into an open street or river and let the sun shine on them, which explains the fact that when great cities have recklessly thrown all their sewage into the open river the water has often been cleaner twenty miles below the city than thirty miles above it. But doctors instinctively avoid all facts that are reassuring, and eagerly swallow those that make it a marvel that anyone could possibly survive three days in an atmosphere consisting mainly of countless pathogenic germs. They conceive microbes as immortal until slain by a germicide administered by a duly qualified medical man. . . . In the first frenzy of microbe killing surgical instruments were dipped in carbolic oil, which was a great improvement on not dipping them in anything at all and simply using them dirty; but as microbes are so fond of carbolic oil that they swarm in it (*sic*), it was not a success from the anti-microbe point of view. . . . The popular theory of disease is the common medical theory: namely, that every disease had its microbe duly created in the Garden of Eden, and has been steadily propagating itself and producing widening circles of malignant disease ever since. It was plain from the

first that if this had been even approximately true, the whole human race would have been wiped out by the plague long ago, and that every epidemic, instead of fading out as mysteriously as it rushed in, would spread over the entire world. It was also evident that the characteristic microbe of a disease might be a symptom instead of a cause. . . . When Florence Nightingale said bluntly that if you overerowed your soldiers in dirty quarters there would be an outbreak of smallpox among them, she was snubbed as an ignorant female who did not know that smallpox can be produced only by the importation of its specific microbe," and so on *ad-infinity*. He is of course an antivaccinationist, and accuses us of "stealing credit from civilization," and claiming results for our specific prophylaxis which are due wholly to the modern trend toward cleanliness.

On the one hand, our trades unionism, by which he refers not to our organization of medical societies, but to what he terms the theory of our omniscience, our conspiracy to hide our shortcomings, and our advocacy of vaccination and like practices, purely because of their fee-producing possibilities; on the other hand our lack of organization, which leads to the employment of men of ability in special lines, to do general work in which they do not excel,—are subjects in which his faculty for exaggeration and his facility in piling up words are given full vent.

Our unfamiliarity with statistical methods meets his condemnation: what he calls our slavish subjection to public fashions in therapy he commiserates, and he sympathizes with our hardships: "A review of the counts in the indictment I have brought against private medical practice will show that they arise out of the doctor's position as a competitive private tradesman; that is out of his poverty and dependence. It should be borne in mind that doctors are expected to treat other people especially well, whilst themselves submitting to specially inconsiderate treatment. The butcher and baker are not expected to feed the hungry unless the hungry can pay; but a doctor who allows a fellow-creature to suffer or perish without aid is regarded as a monster. Then there is the disregard for his own health and comfort which results from the fact that he is, from the nature of his work, an emergency man . . . . We

think no more of the condition of a doctor attending a case than of the condition of a fireman at a fire. In other occupations night work is specially recognized and provided for . . . . But a doctor is expected to work day and night. To the strain of such inhuman conditions is added the constant risk of infection. One wonders why the impatient doctors do not become savage and unmanageable, and the patient ones imbecile."

As for our science: "Doctoring is an art and not a science; any layman who is interested in science sufficiently to take in one of the scientific journals and follow the scientific movement, knows more about it than those doctors (probably a large majority) who are not interested in it and practice only to earn their bread. Doctoring is not even the art of keeping people in health . . . . it is the art of euring illnesses."

At last we have come to the nub of his discourse. Shaw, unlike Molière, has a panacea which will cure all of our disabilities, and remedy all of the ills of the body politic. And he tries to bribe the profession into acquiescence in his scheme for its betterment, by appealing to its self-interest through offers of relief from the hardships of practice, and adequate compensation for all from the public funds. "The social solution of the medical problem depends on that large, slowly advancing, pettishly resisted integration of society called generally Socialism. Until the medical profession becomes a body of men trained and paid by the country to keep the country in health, it will remain what it is at present: a conspiracy to exploit popular credulity and human suffering."

The natural inferences from Shaw's discussion of his "Public Health Service," which he contrasts with what he calls the "Private Illness Service" of today, are:

a. That the thought of disease as something necessary is a medical inheritance from the dark ages, and should be replaced by the view that all disease is preventable. And he intimates that if all the doctors were in the employ of his "Public Health Service" the ideal diseaseless state would be attainable immediately.

b. That prophylaxis is wholly a lay concept, which has had to be forced upon the unwilling anti-scientists of the medical profession.

With reference to the first theme, a, it may be said that the Utopian dream that all dis-

ease is preventable has long been the speculation of the medical hygienist, but bitter experience has chastened his desire, and the limits of practical possibility have restricted his activities, even with the infectious diseases whose causation is known. The theory, which many hold, that robustness spells immunity to infectious disease, has been exploded for the *n*th time by the recent epidemic of influenza. To the literary dilettante in hygiene, who is still in the "bad smell" stage of disease causation, and who adopts a superior air when germs are mentioned, the solution of the disease prevention problem is easy. Scrubbing, whitewash, plumbing and drains are all that are necessary. We have come to learn, however, that the problem is not as simple as it seems to the casual observer.

Cleanliness, disinfection, sewerage and drainage are valuable means of preventing the gross contamination of our water and food supplies, and of destroying insect carriers, but the real difficulties of present day prophylaxis revolve about the question of the human carrier of disease germs, who is usually not sick, and is often discovered only after exhaustive search. For every recognizable case of infectious disease there are several "healthy" carriers. Even after we have discovered the carrier, we are puzzled as to what to do with him. Our problem is to keep the infectious material from the carrier out of the mouths of susceptibles. If we were to attempt to isolate every carrier of disease germs capable of producing infection on transfer to others, we should have a large part of the human race under quarantine. So close is the union, the symbiosis, of the germ with the human being in the case of the carrier, that the destruction of the bacterium, without injury to his human host, is a problem which often resists our every effort. We can require the carrier to find employment where he does not have to handle food, and we can ask him to take precautions about contaminating others, but in most cases we are compelled to depend upon his good faith in carrying out our orders.

If our difficulties are so great in dealing with diseases of known external infectious causation, how are we going to eliminate off hand the diseases of unknown internal causation? I am afraid that the medical schools must continue to teach, and the profession to practice therapy, in spite of Shaw's piratical suggestion that we let

the sick walk the plank, and focus all attention on the well. In the culture of food animals, the Shavian policy is carried out almost to the letter. Free living creatures, which are not subjected to the confinement and the intimate and varied contacts of the human environment, are rigidly selected in breeding—for brawn and not for brains. No animal is permitted to live long enough to encounter the disease processes of old age. The weaklings and the seriously diseased are ruthlessly destroyed, since "sound economics" is the governing factor, and all "sentimental" considerations are waived. And yet, notwithstanding the activities of agricultural departments and bureaus of animal industry, diseases of domestic animals, though checked, continue to flourish. Furthermore, although economic limitations control the amount of treatment which can be afforded, veterinary therapy is still practiced.

The second thesis, *b*, is too absurd to require much discussion. To the public which knows that it was medical prophylaxis which made possible the construction of the Panama Canal; which eliminated typhoid and dysentery as army scourges; which, by delousing men, removed the possibility of typhus as an added war horror; which is regenerating the South and the tropics by destroying the hookworm—to mention only a few notable instances—such claims must appear to be what they are—ridiculous. Modern "doctoring" is not only the "art of curing illnesses;" it is also the science of "keeping people in health."

Socialism may be the solution of the problems in the factitious medical world, which Shaw has taken so great pains and so many phrases to construct, but whether this is equally true in the actual medical world must remain a subject for discussion. One hates to believe that the splendid altruism, which is the crown of glory of the medical profession, and its resultant urge to enthusiastic effort for the public good, must give way to the sordid self-interest of the sort of socialism which Shaw sanctifies.

And now it is a pleasure to turn from the artifice and prolixity of Molière's doctors and of Shaw to the simpler diction and kindly enthusiasm of Kipling.

Rudyard Kipling, in an address to the students at Middlesex Hospital, said several years ago: "It may not have escaped your professional



observation that there are only two classes of mankind in the world—doctors and patients. I have had some delicacy in confessing that I have belonged to the patient class ever since a doctor told me all patients were phenomenal liars where their own symptoms were concerned.

Speaking as a patient, I should say that the average patient looks upon the average doctor very much as the noncombatant looks upon the troops fighting on his behalf. The more trained men there are between his body and the enemy, he thinks, the better.

"I have had the good fortune this afternoon of meeting a number of trained men who in due time will be drafted in the permanently mobilized army which is always in action, always under fire, against death. Of course, it is a little unfortunate that Death, as the senior practitioner, is bound to win in the long run, but we non-combatants, we patients, console ourselves with the idea that it will be your business to make the best terms you can with Death on our behalf; to see how his attacks can be longest delayed or diverted, and when he insists on driving the attack home, to see that he does it according to the rules of civilized warfare."

"Every sane human being is agreed that this long drawn fight for time that we call life is one of the most important things in the world. It follows, therefore, that you, who control and oversee this fight, and who will reinforce it, must be among the most important people in the world.

"Certainly the world will treat you on that basis. It has long ago decided that you have no working hours that anybody is bound to respect, and nothing except your extreme bodily illness will excuse you in its eyes for refusing to help a man who thinks he may need your help, at any hour of the day or night.

"Nobody will care whether you are in your bed, or in your bath, or on your holiday, or at the theatre—if any one of the children of men has a pain or a hurt in him you will be summoned. And, as you know, what little vitality you may have accumulated in your leisure will be dragged out of you again.

"In all times of flood, fire, famine, plague, pestilence, battle, murder, and sudden death it will be required of you that you report for duty at once, that you go on duty at once, and that you stay on duty until your strength fails you or your conscience relieves

you, whichever may be the longer period. This is your position. These are some of your obligations, and I do not think that they will grow any lighter.

"Have you heard of any legislation to limit your output? Have you heard of any bill for an eight hour day for doctors? Do you know of any change in public opinion which will allow you not to attend a patient when you know that the man never means to pay you?

"Have you heard any outcry against those people who can really afford surgical appliances and yet eadge around the hospitals for free advice, a cork leg or a glass eye? I am afraid you have not.

It seems to be required of you that you must save others. It is nowhere laid down that you need save yourselves. That is to say, you belong to the privileged classes.

"May I remind you of some of your privileges. You and kings are about the only people whose explanation the police will accept if you exceed the legal limit in your car. On presentation of your visiting card you can pass thru the most turbulent crowd unmolested and even with applause.

"If you fly a yellow flag over a center of population you can turn it into a desert. If you choose to fly a Red Cross flag over a desert, you can turn it into a centre of population toward which, as I have seen, men will crawl on hands and knees.

"You can forbid any ship to enter any port in the world. If you think it necessary to the success of any operation in which you are interested you can stop a 20,000 ton liner with mails in midocean till the operation is concluded. You can tie up the traffic of a port without notice given. You can order whole quarters of a city to be pulled down or burnt up, and you can trust on the warm coöperation of the nearest troops to see that your prescriptions are properly carried out.

"To do your poor patients justice, we do not often dispute doctors' orders unless we are frightened or upset by a long continuance of epidemic diseases. In this case, if we are uncivilized, we say that you have poisoned the drinking water for your own purpose, and we turn out and throw stones at you in the street. If we are civilized we do something else, but a civilized people can throw stones, too.

"You have been and always will be exposed

to the contempt of the gifted amateur—the gentleman who knows by intuition everything that it has taken you years to learn. You have been exposed, you always will be exposed, to the attacks of those persons who consider their own undisciplined emotions more important than the world's most bitter agonies, the people who would limit and cripple and hamper research, because they fear research may be accompanied by a little pain and suffering.

"You will find that such people have been with you—or, rather, against you—from the very beginning, ever since, I should say, the earliest Egyptians erected images in honor of cats—and dogs—on the banks of the Nile. Yet your work goes on, and will go on.

"You remain now, perhaps, the only class that dares to tell the world that we can get no more out of a machine than we put into it; that if the fathers have eaten forbidden fruit, the children's teeth are very liable to be afflicted. Your training shows you that things are what they are, and will be what they will be and that we deceive no one except ourselves when we pretend otherwise.

"Better still, you can prove what you have learned. If a patient choose to disregard your warnings, you have not to wait a generation to convince him. You know you will be called in in a few days, or weeks, and you will find your careless friend with a pain in his inside or a sore place on his body, precisely as you warned him would be the case.

"Have you ever considered what a tremendous privilege that is? At a time when few things are called by their right names—when it is against the spirit of the times even to hint that an act may entail consequences—you are going to join a profession in which you will be paid for telling men the truth, and every departure you may make from the truth you will make as a concession to man's bodily weakness and not mental weakness.

"Realizing these things, I do not think I need stretch your patience by talking to you about the high ideals and the lofty ethics of a profession which exacts from its followers the largest responsibility and the highest death rate—for its practitioners—of any profession in the world. If you will let me, I will wish you in your future what all men desire—enough work to do and strength enough to do the work."

Medicine has outgrown the defects which Molière found in the practice of his day, leaving on the shoulders of the law the discarded cloak of pretension, technicality, verbosity and ancestor worship, which furnished the satirical pen of the master with its material for ridicule. Although lacking much of perfection, the practice of today is not guilty of most of the faults which Shaw's position as a propagandist of Socialism, and his naturally distorted vision caused him to find in it. May we continue to grow, not along the narrow lane of selfishness, which Shaw has laid down as the only path to progress, but through the broad road of altruism, with sentiment as a useful stimulant, and rigid scientific oversight as a salutary check to a future which may be worthy of the encomiums of the Kiplings of all time.

## Original Articles.

### COMPULSORY REPORTING AND COMPULSORY TREATMENT OF VENEREAL DISEASES.\*

By B. HENRY MASON, M.D., WORCESTER, MASS.

THE history of venereal disease is written in the earliest records of man; especially do we find definite statements in the Bible, in *Leviticus*, Chapter XV. With the discovery of the specific cause of gonorrhea by Neisser in 1879, and of syphilis by Schaudin in 1905, it became known that venereal diseases are infectious, communicable diseases. Notwithstanding this fact, however, until recently very little has been done to institute prophylactic measures or to insure efficient treatment; and even with the attention this class of disease has received and the efforts made to control it since our nation joined the Allies in the world conflict, very little in the way of prevention has actually been accomplished.

It is the duty of every well living citizen, but more especially the politicians, lawyers, and physicians, to make a strenuous effort to keep venereal disease among the civilian population under control, not because of the bearing it has on society alone, but to maintain maximum in-

\* Read at a meeting of the Worcester District Medical Society at the Worcester State Hospital, Worcester, Mass., April 16, 1919.

dustrial efficiency and conserve the man power of the nation.

The importance of venereal disease to the community from a scientific viewpoint rests chiefly upon these factors.

1. Its transmissibility by sexual intercourse.
2. Its rebelliousness to treatment.
3. Its chronicity and latency which deceive the patient and even the physician.
4. The number of persons rendered permanently disabled and public charges by reason of resulting mental disease.

Keyes, in speaking of the social importance of gonorrhea, says: "A disease that attacks more than half our young men, a disease that affects thousands of children and hundreds of thousands of women is important to society by its prevalence alone. A disease that enters the family almost exclusively through illicit sexual contact, a disease that may be transmitted long after the patient thinks himself or herself well, a disease that may be transmitted to the wife from the prostitute via the offending husband, a disease that may be passed from the wife thus innocently infected to the eyes of her infant at birth or to its genitals thereafter, is eminently important to society. A disease that incommodes the man and may invalid the woman, a disease that unsexes thousands of women, that makes chronic invalids of many, that kills not a few; a disease that in this country causes one-half of the congenital blindness, that is accountable for about one-third of the blind in our asylums, is a peril to society; a disease that causes fully fifty per cent. of the involuntarily sterile, or child sterile marriages, that destroys the power of procreation in man as well as in woman, is indeed a peril to the race."

Much that has been said about gonorrhea might also be repeated when speaking of syphilis, and with these additions:

It is transmissible by heredity. It is frequently contracted by innocent persons with strict morals by reason of carelessness on the part of certain individuals suffering with the disease. It is directly responsible for many cases of mental breakdown; and it is often the cause of mental deficiency in children.

That eminent French specialist, Ricard, when asked about the chronicity of gonorrhea, replied, "A gonorrhea begins and God only

knows when it will end," and the aphorism is as true today as the day it was uttered. Someone has stated in regard to syphilis: "Once a syphilitic always a syphilitic, and on the Judgment Day he will be a syphilitic ghost." Such statements coming from men of international note should forcibly arouse in our minds the question of control and teach us that venereal diseases are a scourge which menaces the industrial efficiency of the nation.

The prevalence of prostitution and sexual promiscuity in our cities make venereal diseases endemic among their population; smaller towns suffer in proportion to the laxity of their morals and their proximity to urban centers. Marrow has estimated that sixty per cent., and Forseheimer that fifty-one per cent. of the male population of the United States have gonorrhea. He adds: "Twenty per cent. of these young men will become infected before their twenty-first year, over sixty per cent. before their twenty-fifth year, and more than eighty per cent. before they pass their thirtieth year."

From the Weekly Bulletin, Department of Health, New York City, August 31, we note that about forty per cent. or approximately six hundred women examined at the night court within the last three months have given positive Wassermann reactions, and about twelve per cent. have given positive gonorrhea complement fixation tests. Various authors estimate that from fifty-five to eighty-seven per cent. of prostitutes are infected with one or more venereal diseases.

It is reported from the Surgeon-General's office that from the time the United States entered the war in April, 1917, to September, 1918, the loss to the army from venereal diseases represented 2,295,000 days of service. With this fact in mind let us stop and think how prevalent gonorrhea is among our young adult male population, for we are also informed that about eighty-five per cent. of all cases of venereal diseases treated in our army during the past year were contracted by the men in civilian life before they entered the military service. We learn from the same source that "prostitution in the United States has resulted in the infection (directly or indirectly) with syphilis of almost a half million men in what is virtually our reserve army;" that "venereal diseases present the most serious communicable disease problem of the war." We are further

confronted by the fact that in the army the number of cases of venereal diseases contracted before and after enlistment was in the ratio of five to one. This shows the great prevalence of this scourge in civil life and that by a system of education, healthy recreation, repression of prostitution, isolation and treatment, which would be entirely applicable to civil communities, the venereal rate has been cut down.

Let us for a moment consider this problem from the mental hygiene point of view.

It has been estimated, and very conservatively, that five per cent. of all people who contract syphilis at some later time develop general paralysis of the insane. Definite figures under present conditions would be hard to get relative to the prevalence of syphilis among the adult population, but eight per cent. appears to be a fairly low estimate. Blood examinations of all patients admitted to our state hospitals show that from twelve to eighteen per cent. give a positive reaction. Of 1698 temporary care cases admitted to the psychopathic department of the Boston State Hospital, 8.4 per cent., over 135, were suffering from a mental disease due to syphilis. As the average cost per week to care for our insane is, at the present time, approximately \$6.50 per patient, the cost to the State for the care and treatment of these 135 syphilitics for one year would be \$45,510. And syphilis as well as gonorrhea is a preventable disease.

The Federal Government took action early in July, 1918, to assist the states in the control of venereal disease by the passage of the Chamberlain-Kahn Bill as a section of the Army Appropriation Bill. Representative Kahn struck forcibly and without fear of criticism at the very heart of the true status of conditions relative to the control of venereal disease when he said: "It well behooves the Government to coöperate with the States in stamping out this curse of the human race. Cases of smallpox, bubonic plague, diphtheria, and scarlet fever must be reported to the local health authorities immediately, and the country, the states, and the municipalities seek to regulate and prevent the spread of those diseases; but through prudery and mawkish sentimentality we have closed our eyes to the serious conditions that exist in our country by reason of venereal diseases."

The following is a summary of the act as it appears in the Army Appropriation Bill:

Section One creates an Interdepartmental Social Hygiene Board to consist of the Secretary of War, the Secretary of the Navy, the Secretary of the Treasury, and the Surgeon-General of the Army, Navy, and Public Health Service; or of representatives designated by the respective secretaries; the duties of said board to be:

1. To recommend rules for expenditure of \$1,000,000 allotted to the states for the purposes authorized under Section Two of this Chapter.
2. To select the institution and fix allotments under Section Six.
3. To recommend such general measures as may seem necessary to carry out efficiently the purposes of this Chapter.
4. To direct the expenditures of the sum of \$100,000 referred to in Section Seven.

Section Two authorizes the Secretary of War and the Secretary of the Navy to adopt measures assisting the states in caring for diseased persons (in detention homes) in order to protect from venereal infection soldiers and sailors of the United States.

Section Three establishes in the Bureau of the Public Health Service a division of venereal diseases.

Section Four provides that the duties of the Division of Venereal Diseases be:

1. To study and investigate the cause, treatment, and prevention of venereal diseases.
2. To coöperate with State Departments of Health for the prevention and control of such diseases within the states; and
3. To control and prevent the spread of these diseases in interstate traffic.

Section Five appropriates \$1,000,000 to be expended in carrying out the provisions of Section Two.

Section Six appropriates \$1,000,000 annually for two years to be allotted to the states on the basis of population for the use of their departments of health in the prevention, control, and treatment of venereal diseases, the payment to each state for the fiscal year beginning July 1, 1919, conditioned on the states raising an equal amount; but payment for the fiscal year beginning July 1st, 1918, to be without such condition. It further appropriates \$100,000 annually for two years to be paid to

suitable institutions for scientific research for the purpose of discovering more effective medical measures in the prevention and treatment of venereal diseases. It further appropriates \$300,000 annually for two years to be paid to institutions qualified for scientific research for the purpose of discovering and developing more effective educational measures in the prevention of venereal diseases, and for the purpose of sociological and psychological research related thereto.

Section Seven appropriates \$200,000 to defray the expense of establishing and maintaining the Division of Venereal Diseases; and appropriates \$100,000 to be used under the direction of the Interdepartmental Social Hygiene Board for any purpose for which any of the appropriations made by this Chapter are available.

Section Eight provides that the terms "State" and "States" used in this Chapter include the District of Columbia.

The Commonwealth of Massachusetts received \$36,603.94 as its allotment under this Act and the State Board of Health took timely and efficient action so far as lay within its power by adopting the following Special Regulations relative to reporting venereal disease:

Special Regulations governing the reporting of these diseases are given herewith. Note carefully that all reports of gonorrhea and syphilis are to be made direct to the State Department of Health, State House, Boston, and *not* to local boards of health, as is the case of all other diseases dangerous to the public health.

The State Department of Health, at a meeting held December 18, 1917, *Voted*, that the list of diseases declared dangerous to the public health is further amended by adding gonorrhea and syphilis, so that the said list now reads as follows:

Actinomycosis	Infectious diseases of the eye:
Anterior poliomyelitis	a. Ophthalmia neo.
Anthrax	b. Sup. conjunctivitis
Asiatic cholera	c. Trachoma
Chicken-pox	Leprosy
Diphtheria	Malaria
Dog-bite (requiring anti-rabic treatment)	Measles
Dysentery:	Mumps
a. Amebic	Pellagra
b. Bacillary	Plague
Epidemic cerebrospinal meningitis.	Pneumonia (lobar only)
German measles	Rabies
Glanders	Scarlet fever
Hookworm disease	Septic sore throat
	Smallpox

Tetanus	Typhus fever
Trichinosis	Whooping cough
Tuberculosis (all forms)	Yellow fever
Typhoid fever	

Reportable to local boards of health in accordance with the provisions of Sections 49 and 50, Chapter 73, Revised Laws.

and  
Gonorrhea  
Syphilis

#### REGULATIONS GOVERNING THE REPORTING OF GONORRHEA AND SYPHILIS.

1. Gonorrhea and syphilis are declared diseases dangerous to the public health and shall be reported in the manner provided by these regulations promulgated under the authority of Chapter 670, Laws of 1913.

2. Gonorrhea and syphilis are to be reported (in the manner provided by these regulations) on and after February 1, 1918.

3. At the time of the first visit or consultation the physician shall furnish to each person examined or treated by him a numbered circular of information and advice concerning the disease in question, furnished by the State Department of Health for that purpose.

4. The physician shall at the same time fill out the numbered report blank attached to the circular of advice, and forthwith mail the same to the State Department of Health. On this blank he shall report the following facts:

Name of the disease  
Age  
Sex  
Color  
Marital condition and occupation of the patient.  
Previous duration of disease and degree of infectiousness

THE REPORT SHALL NOT CONTAIN NAME OR ADDRESS OF PATIENT.

5. Whenever a person suffering from gonorrhea or syphilis in an infective stage applies to a physician for advice or treatment, the physician shall ascertain from the person in question whether or not such person has previously consulted with or been treated by another physician within the Commonwealth and has received a numbered circular of advice. If not, the physician shall give and explain to the patient a numbered circular of advice and shall report the case to the State Department of Health, as provided in the previous regulation.

If the patient has consulted with or been treated by another physician within the Commonwealth and has received the numbered cir-

cular of advice, the physician last consulted shall not report the ease to the State Department of Health, but shall ask the patient to give him the name and address of the physician last previously treating said patient.

6. In case the person seeking treatment for gonorrhea or syphilis gives the name and address of the physician last previously consulted, the physician then being consulted shall notify immediately by mail the physician last previously consulted of the patient's change of medical adviser.\*

7. Whenever any person suffering from gonorrhea or syphilis in an infective stage shall fail to return to the physician treating such person for a period of six weeks later than the time last appointed by the physician for such consultation or treatment, and the physician also fails to receive a notification of change of medical advisers as provided in the previous section, the physician shall then notify the State Department of Health, giving name, address of patient, name of disease, and serial number, date of report, and name of physician originally reporting the case by said serial number, if known.

8. Upon receipt of a report giving name and address of a person suffering from gonorrhea or syphilis in an infective stage, as provided in the previous section, the State Department of Health will report name and address of the person as a person suffering from a disease dangerous to the public health and presumably not under proper medical advice and care sufficient to protect others from infection, to the board of health of the city or town of patient's residence or last known address. The State Department of Health will not divulge the name of the physician making said report.

Since the adoption of the above regulations new ones have from time to time gone into effect.

We learn that after these regulations had been in operation eleven months, 10,966 cases of venereal disease had been reported to the State Department of Health. This probably represents about 25% of the total number of

persons suffering from venereal diseases in the State.

Of this number 1,366 were found not to be faithfully following up treatment and, in accordance with the regulations, were after a certain period of time reported by name. Action by the Health Department returned 995 to treatment but there remained 341 who could not be located. Although I do not know the type of personality represented in this group, it is but fair to assume they are so far down the moral scale of life that they continued their lascivious habits uncontrolled, spreading infection broadcast. The State Board has also established several clinics throughout the State, makes laboratory examinations, and is now able to furnish arsphenamine free to physicians and hospitals.

If the control of venereal diseases is a problem which will require radicalism, is it not far better for us to adopt radical measures at once, without false modesty, than to exhibit a state of inertia while this scourge which is directly and indirectly responsible for so much sickness, misery, and general inefficiency sweeps on unabated? Successfully to obtain desired results, we must first have legislation; laws must be placed on the statute books with teeth to them, in order that those who will not voluntarily continue treatment and conduct themselves as instructed may be apprehended and treated. In order to stimulate the establishment of proper legal authority to enable the State and local boards of health, physicians and various social organizations to drive this scourge from the Commonwealth, the following suggestions are submitted for your consideration:

Early diagnosis and treatment are imperative.

For study of legislative programs that have already been enacted outside of the United States relative to the venereal disease problem, those of England, Western Australia, and Germany are of special interest; also the Suggestions for State Board of Health Regulations for the Prevention of Venereal Diseases as printed in U. S. Public Health Reports, Volume 33, No. 13, March 29, 1918, pp. 435-439.

Compulsory reporting is necessary, for if the extent of a contagion is not known its control cannot be regulated.

Compulsory treatment is necessary for the successful handling of all cases where the

\* In asking physicians to carry out the provisions of this section, the State Department of Health appreciates that it is asking more than is authorized by the authority of Chapter 670, Laws of 1912. This courtesy is requested, however, in the interest of the public health to protect the individual who has conferred with the regulations laid down for him.

moral tone or intellectual fibre is so poor that they cannot be trusted to carry out instructions.

There should be a law making all records private.

A health certificate from the local health board showing a negative Wassermann should be filed with the clerk before a marriage license could be granted.

Hospital facilities provided which would be available for the whole community. This could be done with little expense to the State by the passage of a law requiring all general hospitals to provide a ward for the care and treatment of venereal diseases; and the establishment of a camp for girls at the Sherborn State Reformatory.

At the present time, excepting two or three institutions in the State, if a person is suffering with a venereal disease he is barred from admission to a general hospital for treatment.

Custodial care for the feeble-minded, especially the feeble-minded prostitute, is important for persons of a physical adult age, but a mental age of a child, diseased, and with no moral fibre in their make-up, who, if allowed to remain in a community will not only return to their old haunts but in many cases beget degenerates to be cared for at the expense of the State.

Those able should be required to pay for the treatment.

Physicians as well as others who fail to comply with the laws, rules, and regulations established should be liable to penalty.

We recognize that in order to have any law successful we must receive the support and co-operation of the people. This would be readily given, I believe, by almost all well living citizens; and further strengthened by a campaign of enlightenment and education of the general public by speakers, motion pictures, posters and such other means as might be outlined by the State Board of Health.

As a means to an end sex education should be taught in our high schools and academies, not as a separate course but in conjunction with courses in botany, biology, physiology, and hygiene, so that all students would receive some knowledge first-hand of the dangers and risks of immorality.

## THE TREATMENT OF ROUND SHOULDERS.\*

BY E. H. BRADFORD, M.D., BOSTON.

A SPECIALTY OWES to the general profession the gift of added knowledge from increased opportunities of generalization and investigation on special subjects.

The orthopedic surgeon should give the results of his experience to the practitioner in a plain statement of the proper management of cases of the common deformity called round shoulders, seen frequently in growing children.

The distortion popularly known as "round shoulders," "stoop shoulders," a form of curvature of the spine, as a chronic affection, comes under the direction and care of orthopedic specialists or surgeons who have given some attention to this special branch of surgery who are cognizant of the causes and nature of this abnormality in growth. In certain instances, however, no surgical care is needed and the services of the masseur or physical culture teacher are all that are needed.

Considering the environment of children it is by no means strange that many growing children are flat-chested and round shouldered, or that these deformities so often persist. The young child passes rapidly through the quadrupedal and half-erect stage of infancy before the spinal column shapes itself and becomes strong enough to bear the super-imposed weight of the head and trunk without sagging into abnormal curves. Under abnormal conditions, chiefly from inadequacy of muscular and ligamentous strength, abnormal curves develop which may persist if the faulty conditions are not relieved.

Many of these curves correct themselves naturally. The child, under normal conditions, tends to grow to type.

It is important to be able to determine what children are threatened with an increase of these curves and what abnormal conditions should be removed. As many children in civilized communities do not enjoy the free untrammelled life of physical activity proper for normal growth, and spend, in each day, of twelve or more waking hours (usually at least six or eight), seated in ill-fitted chairs weakening the back muscles and subjecting the intervertebral ligaments to constant abnormal strain from faulty posture, it

\* Read at a meeting of the Surgical Section of the Suffolk District Medical Society.

is not so strange that there are many round-shouldered children as that there are not more.

In addition to this there are the trammels of faulty clothing and the debilitating effect of imperfect hygiene which cannot be disregarded as determining factors.

The physician, asked to give advice, should be able to recognize the most influential of the defective conditions and be able to suggest practical remedies. His judgment will be based upon accurately observed facts indicating whether the curves are increasing or diminishing. As the change is gradual, his memory of the previous condition of the curves alone would furnish unreliable data.

After determining that a case needs treatment, the method most suitable in a given instance must be selected. The question whether in a given case of abnormal curves of the spinal column there is need of exercises to strengthen weak muscles, or in addition, of recumbent rest to remove the weight load of the erect position on a spinal column not strong enough for the erect attitude, is one of judgment based upon a common-sense estimate of the child's strength and condition.

Where exercises for the back and trunk muscles are necessary, they should be simple and of a character that can be performed at home daily and suited to the needs of the individual case. Class exercises a few times a week are neither adequate nor always adapted to the special indications for the development of special muscles or the personal strength of the individual child.

The muscles usually needing strengthening are the long muscles of the back and neck. Sometimes the glutei, the abdominal muscles, need to be strengthened, and often the muscles attaching the scapula to the trunk. The exercises should be either free or requiring only the simplest of apparatus, dumb-bells, rubber-band exercises or the ordinary weight and pulley machines.

It is not difficult to determine whether a given exercise is suitable by inspecting or palpating the bare back while the patient is exercising. The muscle brought into play can be seen or felt in contraction.

The services of a specially trained attendant are usually not necessary for a properly-trained amenable child, as the exercises should be made intelligible to the mother or an intelligent child's nurse.

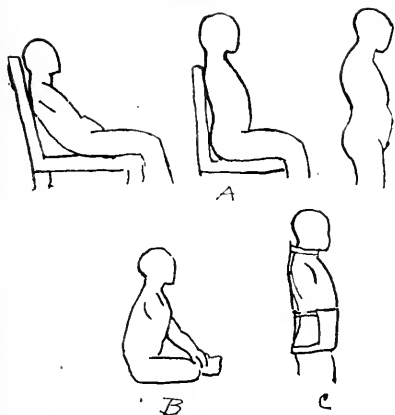
Exercises expanding the chest are manifestly beneficial. For this reason, running at play should be encouraged and deep breathing advised as a part of the routine of daily exercise. Creeping on hands and knees may also be prescribed in sagging backs and round shoulders.

The amount of recumbent rest necessary daily for a growing child with inadequately strong spinal column depends not only upon the general condition of the child but upon the degree of curvature, its increase or stationary character while under observation, and the expected rate of growth as determined by the child's age, appearance, and hereditary race and stock predisposition.

Too long recumbency weakens a child's muscular strength and is unhygienic. Daily recumbency as a break in the long-continued back strain between daybreak and dark is beneficial. Flat recumbency or the prone position, however, are usually irksome to a child and enforced idleness is often undesirable. But the inclined position may be made to be of service, meeting the conditions of relief of back strain and yet permitting reading and active use of the hands. For this reason a reclining board, placed upon the bed and raised at one end, is an improvement upon the hard floor advocated by our grandmothers in the treatment of hollow backs and round shoulders in those disciplinary days. The board should be long enough to reach from above the head to below the buttock and should be placed at such a slope as to support the greater part of the weight of the head and trunk and also to permit reading. The board should be narrow, allowing free play of the shoulders. If the patient has a hollow back, the knees should be flexed and supported by a pillow. In the case of a flat back this is unnecessary.

Reclining chairs are not always easily obtainable properly fitted to the size of the child. There is no doubt, however, that the use of such chairs would be beneficial. While it is impossible to avoid the use of ordinary chairs in the daily life of a growing child threatened with round shoulders, their use, especially if high-backed and deep-bottomed, should be as restricted as possible. Ideal conditions for the backs of growing children would be constant, varied activity, especially climbing, arm-hanging, pulling exercises, with prescribed times of rest in the recumbent or prone positions with as





A, Faulty chair attitude and weakened back; B, Floor sitting correcting hollow back attitude; C, Check-rein brace.

little sitting as possible in adult sized seats. The nearer these conditions can be furnished, the better for the backs of children in our communities. Individuals accustomed to carry burdens upon their heads develop poise and a strong erect carriage. For this reason the daily carrying for a definite time upon the head of a pillow or a light sand-bag is advisable to aid the patient to improve in posture.

The physician must bear in mind that in this type of affliction change is slow, as he is dealing with the problem of growth; that constant and reliable notes of progress and change must be made; that properly prescribed daily exercises must be enforced as strictly as a diet for a dyspeptic; that relief from too long downward pressure upon an erect spine is usually needed, and that simple appliance may for a time be necessary.

It is impossible in cases differing as widely as do those affected with this class of deformity to present a statistical statement of results of treatment. So many factors enter into the problem that before and after treatment facts may be misleading. Anyone, however, who has watched carefully for years the growth of a number of children with these deformities will be convinced that there can be no doubt that permanent improvement in figure and carriage in these cases can be brought about by proper direction and management.

It is essential to remember that children with round shoulders should be loosely dressed; they should sit as little as possible in deep-seated or

high-backed chairs; they should play actively and should rest at stated intervals in a reclining or recumbent position; they should perform daily carefully prescribed exercises.

If on account of the threatening character of the curve a spinal support is necessary, it should be effective, light, simple and not unsightly.

Careful tracings should be taken from time to time of the side view cross-section outline of the back and front of the trunk, not including the shoulder blades.

Surgical judgment, trained by the accurate observation of a number of cases, is needed to determine when the curve threatens to become a permanent deformity and what measures are needed to effect permanent correction.

It is not difficult for a thoughtful and observant mother to determine an abnormal stiffness of the spine of a round-shouldered child. The back of a child of ten or younger should be fairly flexible and if the child lies flat upon his back on a hard surface like the floor, there should be little or no space between the spines and the floor except at the neck and a limited region at the end of the spine above the sacrum when the legs are straight. If, however, the thighs are well flexed, normally the lower part of the back can be flattened so as to touch the floor. The chest should be well-rounded and the shoulders drop back to contact with the floor.

Deviation from this standard means an abnormality in curves, varying in importance according to the extent of the variation. The school teacher can easily recognize the weak-backed school child by watching the frequent changes of, or abnormal attitude at his desk.

All exercises and treatment should be of a character as to be applicable for home treatment, as the deformity, being one of growth and not of disease, is correctible only by long continued daily treatment.

An adequately accurate record can be made by means of a tracing rod kept by a flat pencil bearing base plate at right angles to the plane on which the tracing paper is secured—the wall of the room or any even surface. The other end of the rod passes along the line of the vertebral spines behind, and in front along the median line of the chest; and to avoid the scapulae, must be bent to clear the projecting shoulder blades.

In certain cases of threatening and increasing curves, when the patient's strength is not suffi-

cient to justify strenuous exercises and when rapid growth is to be expected, some form of spinal support may be necessary to be worn at times when recumbency or rest of the spinal column as a method of treatment is impossible.

Such appliances are inadequate if they merely hold back the shoulder blades or furnish crutches under the axillae. What is needed is something which will prevent the head from stooping forward, the chest from flattening and, in some cases, the dorso-lumbar spine from forward bending. The apparatus, besides being effective, must be light, easily applied and not unsightly.

Such a "check-rein" brace can be easily furnished by riveting a short cross-piece of flat steeling to an upright long enough to reach from the lower part of the neck to the middle of the sacrum; the cross-piece, long enough to reach from the middle of one scapula to that of another, is attached to the upright a few inches below its top. This cross-shaped appliance is furnished with webbing straps below and a neck band above, and, if at the end of each cross-piece, webbing straps be attached, passing over the shoulders, crossing behind in the back and fastened by buckles secured on a leather piece placed on the abdomen to which the straps at the bottom of the upright are also secured, the patient's shoulders can be pulled back, the protruding abdomen pressed back and the neck and head checked from falling forward, with at the same time a forward pressure exerted by the upright upon the backward curving portion of the spine, requiring a felt pad to prevent chafing.

It is on the judicious and sensible utilization of such practical methods as are possible, applying them as continuously as possible, that the practitioner must rely in guiding the correcting growth which in children tends to grow to normal type if proper conditions exist.

The same means are of service also in young adults in whom osseous changes or too persistent ligaments have not been developed.

The treatment is necessarily tedious, but it need not be burdensome and satisfactory results are obtainable as a reward to painstaking diligence.

## ALCOHOL AS A FACTOR IN THE PRODUCTION OF EPILEPSY AND ALLIED CONVULSIVE DISORDERS.

BY D. A. THOM, M.D., PALMER, MASS.,

*Pathologist, Monson State Hospital.*

[From the wards of the Monson State Hospital.]

ALCOHOL as a factor in the production of epilepsy and allied convulsive disorders may have its origin in either the parents or the patient. I am skeptical only regarding the effect of alcohol when found in the collaterals or grandparents.

The use of alcohol by the parents may occur in any one of the three following ways: first, chronic alcoholism in one or both parents; second, acute intoxication of one or both parents at time of conception; third, the use of alcohol by mother during pregnancy.

Chronic alcoholism in one or both parents is undoubtedly responsible for no small percentage of the hereditary epilepsies; while acute intoxication at time of conception and the use of alcohol by mother during pregnancy would account for but a relatively small percentage; yet, they must be considered in a discussion of this kind.

Dr. Matthew Woods of Philadelphia reported in the *Journal of the American Medical Association*, Vol. LXI, No. 26, 7 cases of epilepsy in children traced to a single intoxication on the part of one or both parents at time of conception, otherwise teetotalers. The cases were outlined so briefly and the impression was given that so much had been taken for granted by the author, that one was inclined to feel that he had been asked to accept much on little evidence. Tredgold states that Demereaux, Dehant and Doison have traced cases of epilepsy to an alcoholic intoxication at time of conception. On the other hand, he goes on to quote Dr. Ireland, who found that in some parts of Scotland, where it was customary for whole villages to get drunk at New Year's time, that it has never been noticed that the resulting children were idiotic. He also mentions that a similar celebration takes place at the end of the fishing season, without noteworthy results.

To my mind the study of a large group of cases, such as came under the observation of Dr. Ireland, is far more convincing than the selection of a few isolated cases here and there and using them to prove the point in mind. Yet the question is by no means settled, and it

will be well to keep it in mind when taking family histories, as one of the possible predisposing factors of epilepsy.

Perhaps the skepticism in my mind may be due to the fact that I have yet to see a case of epilepsy where I believed that an acute alcoholic debauch by the parents (which was not an acute exacerbation of a chronic condition) was its origin.

It is quite conceivable that the use of alcohol by the mother during pregnancy may so effect the development of a growing fetus that a nervous system of impaired durability and stability may result, manifesting itself in epilepsy, feeble-mindedness, or, perhaps, some other neuropathic taint.

The following case which came under the observation of Dr. Tredgold, in which the alcoholism resulted in amentia, offers a good example:

The father was a hard-working industrious man, sound in body and mind, and coming of a healthy and long-lived family; he married the daughter of a small publican, apparently a healthy and happy girl, who used occasionally to serve behind the bar. Shortly after marriage this girl developed an insatiable craving for drink, all the money she could obtain by any pretence whatever went in procuring it. Later, the ornaments and then the furniture of the house were pawned to feed her desires. Ten months after marriage she gave birth to a child, a hydrocephalic idiot; and according to the husband, she had scarcely known a sober moment during the preceding four or five months. Further inquiry showed that this woman's father was also a heavy drinker, but otherwise there was an entire absence of any neuropathic condition in the family.

He goes on to state:—

It may be that the alcoholic taste of the mother was in itself evidence of the neuropathic diathesis, but I cannot help thinking that the child's condition was more largely due to an actual poisoning during its intrauterine existence, and this view seems to be supported by the subsequent history, for the next child that was born, after an interval of nearly two years, was perfectly normal and is now a bright and intelligent boy of eight years; by this time, however, the mother has recovered and had lived a perfectly steady life during the whole of the pregnancy.

A word further might be said regarding

chronic alcoholism and its relation to epilepsy. The fact that alcohol in the parents was responsible for a certain amount of the epileptic offspring has long since been established, and, in many cases, undoubtedly exaggerated. Dejerine claims that in France over one-half the epilepsy in children is due to alcoholic parents. Stuchlik writes from Bohemia that his study of family histories of 176 epileptics showed alcoholism in one or both parents, 36 per cent.; among the grandparents, 38 per cent. He states further that in 50 per cent. of the cases in which parents were alcoholic, the collaterals and grandparents were healthy. Binzwanger attributes 22 per cent. of the epilepsy in Germany to alcoholism; while, in this country, Spratling, from the Craig Colony, gives 14 per cent. My own tables, compiled from the records of Monson State Hospital, showed that 14.6 per cent. of the cases with heredity may be attributed to alcohol.

To be sure, alcohol was found in other cases, but always associated with some other genetic factor. I am sure that no one in this country who has had very broad experience with epilepsy will agree with Matthew Woods in his claim that alcoholism explains 35 per cent. of the epilepsies. I think that, in this country, between 10 and 15 per cent. of the institutional cases might find their genesis in alcoholic parents, but I should not expect it to be doubled or trebled in France. Carl von A. Schneider, M.D., very aptly states, in his article on "Studies of Alcoholic Hallucinoses, reported in the *Psychiatric Bulletin of the New York State Hospital*, Vol. IX, No. 1, that "Alcohol as an hereditary and etiological factor in the production of insanity has been overrated." I am sure this statement applies to epilepsy as well as insanity. The remaining portion of this paper will consider alcohol solely as an etiological factor; first, by acting directly upon the nervous system usually predisposed by hereditary taints and producing convulsions in a comparatively short time; second, by effecting intermediate changes outside the central nervous system, of which chronic kidney disease and arteriosclerosis are the best examples.

This latter group of cases is too far removed from the province of psychiatry or neurology to be of special interest to us at this time. It may be said, however, that the onset of convulsions in this group is usually late, often occurring in the fifth or sixth decade. Seizures associated with

chronic kidney diseases may occur earlier. They are usually of the grand mal type, are apt to occur in a series, and are not often associated with mental deterioration, many of these cases dying in coma following convulsions. The convulsions associated with arteriosclerotic cases, or more specifically, cerebral endarteritis, do not usually occur in series and are usually associated with dementia. Many of these cases die from cerebral hemorrhage following a convulsion.

I am cognizant of the fact that I am subjecting myself to criticism, perhaps, on the ground that alcohol is not a definitely established factor in the production of either chronic kidney disease or arteriosclerosis, but until we are able to establish a better etiology for a large group of toxic kidneys I am willing to accept the alcoholic origin; and while I am willing to concede that the relation between alcohol and arteriosclerosis is still problematical, I believe it is worthy of consideration. The last group of cases which enters into this discussion are those in which alcohol acts as the exciting factor in the production of the convulsions. In fact, in some of these cases, it appears to be the sole cause.

Notwithstanding the fact that we are often unable to establish any cause for the convulsion other than alcohol, I am strongly of the opinion that in a perfectly stable and well-adjusted nervous system alcohol *per se* is not sufficient to produce convulsions. To be sure, had the patient not indulged in alcohol that factor as an exciting cause would have been removed, and it is fair to assume that the patient would not have suffered from convulsions, unless, perchance, some other extraneous exciting factor were encountered. Yet, as practically all the cases of alcoholic epilepsy occur in men and almost always late enough in life to avoid most of the shoals upon which the predisposed are usually wrecked, we have no reason to doubt the foregoing assumption that the epilepsy in the following cases is justly attributed to alcohol. I will cite, as briefly as possible, 5 cases which divide themselves into two groups:—

1. Cases that have come under institutional care early after the onset of the convulsions (usually within four years).

2. Cases which have had convulsions for several years before coming under institutional care (often over six years).

#### GROUP I.

W. K. Admitted March 23, 1914. Age thirty-one. Occupation, laborer. Education, first year grammar school.

*Family History.* Father died at sixty-five of heart failure. Mother died at fifty-one of Bright's disease. Family history otherwise negative.

*Personal History.* Birth normal. Had scarlet fever at twenty-eight; measles in infancy.

*Physical and Neurological Examination.* Negative, except for impaired hearing in left ear.

Urinalysis and Wassermann test negative.

*Epilepsy.* First convulsion at age of thirty-one; duration of epilepsy before admission, four years.

*Hospital History.* Patient had first convulsion during the fifth month after admission; has had none since July, 1914. He has worked every day since admission to hospital as a painter. His work is efficient, he is trustworthy, shows no evidence of irritability, impulsiveness or violence, and is not demented.

A. L. Admitted Dec. 3, 1913. Age thirty-five. Occupation, salesman. Education, high school.

*Family History.* Father died of heart trouble at age of sixty-four. Mother is living and well, age, sixty-seven. Two brothers and two sisters living and well. Family history negative.

*Personal History.* Birth normal. Had scarlet fever at nine years of age.

Urinalysis and Wassermann test negative.

*Epilepsy.* Began four years previous to admission. Attacks generally occur at night. Patient had always been a heavy drinker, and had been using alcohol to excess just previous to first convulsion.

*Hospital History.* Patient had three attacks during the first month here; had another attack eleven months later; another five months later, and still another four months later. Has had no seizures for the past six months.

He has worked steadily since admission in kitchen and bakery. His work is efficient, he is even tempered and shows no evidence of dementia. All of the convulsions since admission to the institution have been preceded by drinking sprees, patient leaving the institution grounds without permission, going to town and purchasing liquor.

V. B. Admitted May 2, 1914. Age forty-three. Occupation, laborer.

*Family History.* Father died from gangrene. Mother alive and well. One sister living and well.

*Personal History.* Labor normal. Patient had one convulsion during dentition. Had measles and whooping cough; otherwise medical history negative up until onset of convulsions.

*Physical and Neurological Examination.* Negative.

Urinalysis and Wassermann test negative.

*Epilepsy.* Patient had first convulsions at tenth month; remission of thirty-eight years, when they began again, always being preceded by alcoholic sprees.

*Hospital History.* Patient had one convulsion during first month here, then remission for six months; had second convulsion during seventh month, then another remission for six months; then had two convulsions, and has had none since July, 1915. He has worked efficiently about the grounds since admission, and has abstained totally from the use of alcohol. He shows slightly mental deterioration in the form of memory defect.

#### GROUP II.

J. G. Admitted May 26, 1910. Age forty-five. Occupation, clerk. Education, grammar school.

*Family History.* Father died at seventy-two of old age; mother died of indigestion at age of seventy. One brother insane.

*Personal History.* Birth normal. Had measles and whooping cough. Medical history negative until he was twenty-four years old, when he had empyema following pneumonia.

*Physical Examination.* Negative, except for marked constipation and evidences of arteriosclerosis. Following the death of his mother, four years previous to admission, patient began to drink to excess; as a result, was committed to Foxborough State Hospital. He remained there for a period of two and a half years, and during part of the time he was given slight financial recompense for his services. Grand mal attacks began after the excessive use of alcohol following the death of his mother.

*Hospital History.* Patient was in the hospital six months without convulsions, left on visit Oct. 20, 1910, remained away until Jan. 24, 1911. He had one convulsion six months after return,

and they have persisted regularly ever since, with a few exceptions. He seldom has more than one grand mal attack, and during this interval has gone seven months without any seizures.

E. H. Admitted June 18, 1909. Age forty-eight. Duration of epilepsy, ten years. Hospital stay, six and one-half years. Heredity.

*History of Convulsions.* Patient was treated at Bridgewater State Hospital for six months, had three minor attacks during that time. Left June 11, and was seen by a physician June 13, who states he had numerous attacks. Was admitted to Monson State Hospital June 18, 1909, went fifteen months with only one spell, in spite of the fact that during this period he had taken some liquor. During the next sixteen months, with occasional sprees, he had four convulsions. From Aug. 4, 1911, to March 9, 1912, patient was away on a visit. (This was the beginning of his severe and frequent attacks.) Since that time he has accepted every opportunity for liquor and has never gone more than two months without a convulsion and has had as many as five in one month.

The five cases I have used to illustrate the value of early institutional treatment represent only a small percentage of the cases that are under the care of the State, in which alcohol was the exciting cause of the epilepsy. "Run fits," a term which is so commonly used and often to which so little value is attached, signifies a dormant epilepsy which has been brought out by the use of alcohol, as shown in the cases noted above. The prognosis for those who receive early and proper care is very good, while those cases which fall in Group II are practically hopeless. The therapeutic test is the only one upon which we can absolutely rely. No case of epilepsy should be considered so hopeless as not to warrant the aid of our best skill and endeavors, while every person who gives a history of convulsions, whether in infancy, childhood or adult life, should be considered potentially epileptic and the prognosis made accordingly.

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AWARD OF HONORARY DEGREE TO DR. HARVEY CUSHING.—At the Commencement exercises of Yale University, the honorary degree of Doctor of Science was awarded to Dr. Harvey Cushing, professor of surgery at Harvard University.

# THE BOSTON Medical and Surgical Journal

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## A VIGOROUS MEDICAL SEPTUAGENARIAN.

JULY 12, 1849. William Osler first saw the light and has been flooded with it ever since. We are grateful for his birth, for his beneficent life, the current of which still runs strong, deep, and clear. This is no time or place to catalogue his achievements. May that time and place be still far distant. But do we not sometimes make a mistake in putting off until after a man dies a full expression of our estimate of him?

To no member of its body today does the profession of medicine owe so great a debt—not that humanity is not also deeply in his debt. Jenner or Pasteur has his first mortgage on mankind, his second on men of medicine. With Osler the order is reversed. He has made no profound or fundamental discovery; but no one of our day has, in his life, teaching, and example, so radiated, far and near, an inspira-

tion to his fellow physicians. Wide and accurate learning; enthusiasm in the pursuit of truth; a character in which elevation and charm are singularly marked and rarely blended; a personality which wins perforce the love, admiration, and respect of all who come within his influence; a kindly eye which sees the good in every man and thus stimulates him to better it—these are the main threads woven into the fabric of his beautiful life. Who that meets him, who that reads his essays and addresses, in particular, does not come forth or rise with renewed strength and hope to the service of his fellow-man, a better soldier in the medical corps of the Divine army? Who can estimate the number of those relieved in body and consoled in mind by the sane optimism and abounding humanity which permeates his life and teaching? Though the Atlantic lies between him and America now, he never seems far off to us. We congratulate ourselves, William Osler, that you are still with us with your hands firm on the plow, running your furrows straight and deep. Our hearts go out to you on this, your seventieth birthday anniversary.

F. C. S.

## MEDICAL NOTES.

**THE DOGS' PROTECTION BILL.**—It has been reported recently in the *Medical Press* that as a result of a deputation from the Royal Society of Medicine to the Home Office, the British Government has decided to amend the Dogs' Protection Bill, to the effect that whenever an applicant wishes to experiment on a dog he must state on his application that the object of his experiment would be frustrated unless it were performed on a dog. Although this amendment places an additional restriction on research, it will make it possible still to continue medical research.

**BRITISH BIRTH AND DEATH RATES.**—The last quarterly return shows that during the three months ending December 31, 1918, British population has decreased by 90,130. The number of births amounted to 296,358, and deaths numbered 296,488. Of the death rate, nearly 20 per cent. was stated to be due to influenza. For the three months ending March 31, there was an excess of deaths over births amounting to

47,002. Statistics for the preceding year during January, February, and March show that births exceeded deaths by 24,303. At the present time, the decline is unprecedented, and presents a serious problem to the British nation.

**MEDICAL CONGRESS AT ATLANTIC CITY.**—The eleventh triennial session of the Congress of American Physicians and Surgeons was held at Atlantic City on June 15. Fourteen other associations met in conjunction with this association, including the American Climatological and Clinical Association, Association of American Physicians, the American Association of Genito-Urinary Surgeons, the American Orthopedic Association, the American Pediatric Society, the American Association of Pathologists and Bacteriologists, the American Ophthalmologists' Society, the American Otological Society, the American Neurological Association, the American Gynecological Association, the American Dermatological Association, the American Society of Tropical Medicine, the American Laryngological Association, and the American Surgical Association.

Dr. Simon Flexner of New York, president of the Congress, presided at the general meetings. Brig. Gen. John M. T. Finney, chief of the surgical division of the medical department of the A. E. F., delivered an address on "Surgical Aspects of Reconstruction," and Dr. Flexner spoke on "Epidemiology and Recent Epidemics."

**APPOINTMENT OF DR. FREDERICK PAUL KEPPEL.**—Dr. Frederick Paul Keppel, of New York, has been appointed by the American Red Cross to the office of Director of Foreign Operations. Before the war, Dr. Keppel was engaged in educational work. In 1910, he was elected dean of Columbia College. At the outbreak of the war, he offered his services to the Government, serving first as assistant to the Secretary of War, and later as third assistant secretary, having charge of all matters pertaining to the social and physical well-being of the men of the army. Since 1908 Dr. Keppel has been secretary and editor of the American Association for International Conciliation. In 1911, he was made a Chevalier of the Legion of Honor.

**THE GERMAN MEDICAL PROFESSION.**—A recent issue of the *Berliner Klinische Wochenschrift* states that there are many physicians in Ger-

many who are unable to find employment. It is among the younger physicians particularly, 5,800 of whom have been graduated during the period of the war, that this situation is most keenly felt. In Austria-Hungary it is said that approximately 700 former military doctors are unemployed, together with 600 or 700 more civilian doctors from German Bohemia and Southern Tyrol, who have been driven to German-Austria because of the creation of national governments. Probably over 1,000 doctors have been left without employment by the political happenings in German-Austria. The outlook for the medical profession in Germany is not improved by the fact that the National Constitutional Convention has approved alterations in the compulsory health insurance regulations which will practically ruin the profession financially, as the fees which doctors receive on behalf of these assured persons amount to about eight cents a visit. It is not improbable that German practitioners may come to this country in large numbers after peace has been signed, unless measures are taken to refuse to issue them license to practice.

**AMERICAN CLIMATOLOGICAL AND CLINICAL ASSOCIATION.**—The thirty-sixth annual meeting of the American Climatological and Clinical Association was held at Atlantic City on June 14, 16, and 17, 1919, in connection with the 11th Congress of American Physicians and Surgeons. Among the addresses delivered were the following:

President's Address, by Dr. Guy Hinsdale; "An Observation Hospital and Training Center for Tuberculosis," by Major Joseph H. Pratt, M.D.; "The Treatment of Tuberculosis in the Army Hospital," by Lieut. Col. Henry W. Hoagland, M.C., U.S.A.; "The Army Tuberculosis Problem As Seen in Massachusetts," by Dr. John B. Hawes, 2d; "An Analysis of the Examination of over 100,000 Men Examined at Camp Lewis by the Tuberculosis Board, and of 25,000 Soldiers Discharged from Service," by Major Ralph C. Matson; "The Treatment of Tuberculosis in Returned Canadian Troops," by Capt. J. Roddie Byers; "The Acute Respiratory Diseases in the Southwestern Camps," by Major J. N. Hall, M.C., U.S.A.; "The Employment of Ex-Patients in Sanatoria for Tuberculosis," by Dr. Harry L. Barnes; "Clinical Features and Management of Influenza," by Dr.

Carroll E. Edson: "Clinical Observations on the Epidemic of Influenza Occurring in the Naval Hospitals of Philadelphia in the Fall of 1918," by Lieut. Commander Judson Daland; "Personal Hygiene in the Prevention of Influenza and other Infectious Diseases," by Major Thomas Darlington; "Medical Work in the British Army in France," by Major George C. Shattuck.

**THE BORDEREL ZANDER TREATMENT.**—The *Medical Press* has reported a demonstration of the Borderel Zander treatment, given recently before the Harrogate Medical Society. This treatment was first brought into practice during the war, and is made up of a system of mechanical exercises, combined with electricity and heat. This treatment was installed at the Ripon Camp during the war, but has been removed since to Harrogate for civilian practice. A record of 60,000 men being benefited by the treatment, of whom 61 per cent. were able to return to military duty, gives evidence of its efficacy in treating stiff and painful joints and other disabling conditions.

**MEDICAL DEPARTMENT OF THE UNIVERSITY OF BUFFALO.**—The forty-fourth annual meeting of the Alumni Association of the Medical Department of the University of Buffalo was held on June 19, 20, and 21, 1919. Experiences were related by alumni of the hospital of their service in the war at Base Hospital 23. Among the interesting addresses which were delivered were the following:

"Study of Infectious Diseases at a Base Hospital," by Major William Vogeler, M.D.; "Method and Application of Transfusion in the A. E. F.," by Major Baldwin Mann, M.D.; "Experiences in a Base Hospital and at the Front," by Major H. W. Titus, M.D.; "Fact and Theory in Practice," by Frederick Peterson, M.D.; "An Effective Treatment for Recurrent, Inoperable, Deep-Seated Carcinoma," by Emil G. Beck, M.D.; "The Therapeutic Use of Digitalis," by Robert L. Levy, M.D.; "The Treatment of Colitis," by Walter A. Bastedo, M.D.; and "Experiences in Spinal Cord Surgery," by Allan B. Kanaval, M.D.

**MALARIA IN THE UNITED STATES.**—It has been estimated by the United States Public Health Service that over seven million people in the

United States are infected with malaria, and that in the South this disease presents a more serious problem than typhoid fever, tuberculosis, hookworm, and pellagra combined.

**HOSPITAL RECONSTRUCTION WORK.**—A report of the Division of Physical Reconstruction, Surgeon General's office, states that of the 338,241 wounded soldiers registered at army hospitals which carry on reconstruction and reeducational work, up to April 30, a total number of 192,225, or 65 per cent., had enrolled in the ward, school, or shop classes which were being conducted for their benefit.

**INFLUENZA-PNEUMONIA MORTALITY IN ILLINOIS.**—During the year 1918 there were 32,324 deaths from influenza-pneumonia in Illinois. This number exceeds by approximately 8,000 the total mortality from communicable disease during an average year.

**MORTALITY FROM CANCER.**—It has been announced that during 1917, there were in England and Wales 18,145 deaths from cancer among males and 23,013 among females. These figures are the highest yet recorded.

#### BOSTON AND MASSACHUSETTS.

**WEEK'S DEATH RATE IN BOSTON.**—During the week ending June 14, 1919, the number of deaths reported was 169 against 216 last year, with a rate of 11.07 against 14.36 last year. There were 22 deaths under one year of age against 34 last year.

The number of cases of principal reportable diseases were: Diphtheria, 40; scarlet fever, 27; measles, 38; whooping cough, 21; typhoid fever, 3; tuberculosis, 43.

Included in the above were the following cases of non-residents: Diphtheria, 5; scarlet fever, 6; typhoid fever, 1; tuberculosis, 1.

Total deaths from these diseases were: Diphtheria, 2; tuberculosis, 17.

Included in the above were the following non-residents: Diphtheria, 1.

Influenza cases, 4; influenza deaths, 1.

During the week ending June 21, the number of deaths reported was 167 against 189 last year, with a rate of 10.94 against 12.57 last year. There were 21 deaths under one year of age against 32 last year.

The number of cases of principal reportable



diseases were: Diphtheria, 43; scarlet fever, 36; measles, 17; whooping cough, 10; tuberculosis, 53.

Included in the above were the following cases of non-residents: Diphtheria, 5; scarlet fever, 3; tuberculosis, 4.

Total deaths from these diseases were: Diphtheria, 3; scarlet fever, 1; whooping cough, 2; tuberculosis, 17.

Influenza cases, 6; influenza deaths, 1.

**WORCESTER CITY HOSPITAL.**—The fifty-eighth annual report of the City Hospital of Worcester, Massachusetts, summarizes the work of that institution during the past year. The hospital has struggled under the same difficulties that have handicapped all civil hospitals: a somewhat depleted staff, the influenza epidemic, and the high cost of living. 6,411 patients were admitted to the hospital and were given 117,621 days' treatment. 24,819 treatments were given in the out-patient department. The average expenditure for each bed occupied continuously throughout the year was \$830.79, the average cost per patient being \$15.93.

There were admitted to the surgical wards 2,240 patients; to the medical wards, 1,780; children, 773; minor accident cases, 824; maternity patients, 641. The out-patient department cared for 4,630 new patients. The training school for nurses graduated 45 nurses.

**NORFOLK STATE HOSPITAL.**—The Norfolk State Hospital offers a definite program for the care of drunkards, providing for each type the treatment which is appropriate. The accidental drunkard is released with admonition; the occasional drunkard is placed on probation, and fined on subsequent arrest; curable cases are placed on probation and sent to the State Hospital, worthy but chronic drunkards to a detention colony, and vicious or criminal cases to the State Farm. On May 17, 1918, the hospital was opened for the admission of women.

The Norfolk State Hospital now maintains departments for men, women, and out-patients. On October 1, 1919, the Government assumed charge of the institution. In the future, the hospital will extend its service not only to alcohol and drug inebriates, but will also serve as a reconstruction hospital for the treatment of types of nervous disease for which the State has made no adequate provision heretofore.

There have been admitted during the year 543 cases. Of this number, 484, or 90 per cent., were voluntary, and 59, or 10 per cent., were committed. The percentage of admissions for alcoholism was 67, and for drug addiction, 33 per cent. The daily average number of patients at the hospital has shown a decrease of 78 as compared with the previous year. The hospital now maintains 29 out-patient offices. A new office has been established at Quincy during the year. 2,978 office visits have been made by patients, and there have been 3,780 home visits.

**NEW ENGLAND DEACONESS ASSOCIATION.**—The twenty-ninth annual report of the New England Deaconess Association reports the development and progress of this institution during recent years. Since 1907, when the "New Hospital" was completed, 13,021 patients, 433 of whom have been ministers or members of their families, have been treated. The sum of \$104,669.00 has been expended in the relief of suffering. Many nurses have been graduated, and are now holding responsible positions in this country and in foreign lands. During twelve years of service, the hospital capacity has been increased from fifty to sixty-seven beds.

The Home in Boston has placed one of its workers in the North Station during the past year. By this means, more than 2,500 travelers have been assisted, and a number of girls have been rescued from lives of degradation. The Industrial Work Department has given instruction to 400 children in sewing, cooking, garment making, basketry, and paper work. Those in charge of the summer work have sent 278 children to the Fresh Air Camp at Haverhill, 242 on day picnics, and have placed a number of others in country homes for two weeks or longer. The Training School for Christian Service graduated fourteen young women in 1918. This school has been able to enlarge its facilities by affiliation with Boston University and Morgan Memorial.

The Deaconess Hospitals in Boston and Concord have had a total number of 2048 patients, and 150 enlisted men have received treatment. Fifty beds were placed at the disposal of the Commanding Officer of the United States Naval Hospital. Twenty-four beds in the Brodbeck Cottage were given over to the Emergency State Board of Health for the treatment of physicians and nurses who had come to Boston from New

York, Philadelphia, and Halifax to help during the influenza epidemic. The X-ray Department has made seven hundred plates for the Medical Department.

The Training School for Nurses has arranged so that in addition to regular class work, the nurses should have a four months' course at Simmons College in anatomy, physiology, chemistry, bacteriology, sanitary science, dietetics, and cooking. Training in obstetrical nursing has been given at the Boston Lying-In Hospital.

**PRESENTATION OF HOSPITAL FLAGS TO MASSACHUSETTS GENERAL HOSPITAL.**—Base Hospital No. 6 and Army Hospital No. 55 have presented their staff flags to the Massachusetts General Hospital. The ceremony was attended by more than five hundred nurses and doctors. The standards were accepted in behalf of the hospital by Dr. Henry P. Walcott, for many years chairman of the board of trustees of the hospital, who praised the work which has been accomplished by the graduates of this institution during the war.

In an address in which he reviewed the history of the hospital unit, Dr. Frederick A. Washburn, late colonel of Base Hospital No. 6, stated that the alumni of the Massachusetts General Hospital have furnished 238 commissioned officers, 228 women nurses, and 80 male nurses and employees for war service with American and allied armies. The original staff of Base Hospital No. 6 was composed almost entirely of the alumni and staff of this hospital.

Dr. Franklin G. Balch, late colonel of Army Base Hospital No. 55, presented the flag of the nurses of this hospital to the Massachusetts General Hospital, and paid tribute to the men and women who served under his command.

**USE OF INFLUENZA VACCINE AS A PROPHYLACTIC.**—In a recent issue of *The Commonwealth*, there is reported an experiment conducted by the Massachusetts State Department of Health in the use of influenza vaccine as a prophylactic. The study involved the vaccination of over six thousand individuals, who represented slightly less than one-half the population of twelve institutions, with a heated suspension of influenza bacilli. Only one of the institutions represented, the Monson State Hos-

pital, proved to be suitable for the experiment. From a study of the conditions in this institution, it was concluded that the heated suspension of influenza bacilli used as a prophylactic vaccine did not prevent influenza, lessen its severity or its complications, and as far as could be determined, resulted in no harmful effects.

**MORTALITY RATES IN BROOKLINE.**—The mortality rates in Brookline have been unusually low during the past year. There were approximately 500 cases of contagious diseases, chiefly measles and chickenpox but no deaths except from tuberculosis. There was a total of 383 deaths, 60 of which occurred among persons who were residing in the town temporarily. This gives a death rate of 8.95 per thousand, which is reported to be less than that of any other city or town in the country. There were 40 cases of diphtheria, 59 of scarlet fever, 6 of typhoid, 205 of measles, 67 of whooping cough, 3 of malaria, and 180 of chickenpox. It has been reported by Francis P. Denny, health officer, that diphtheria has been controlled by the administration by local physicians of antitoxin in suspected cases without waiting for the development of cultures. The records of the sanitary inspector show that 2,151 places have been visited during the year.

**PARKER HILL HOSPITAL.**—It has been announced that the War Department will close the Parker Hill Hospital and transfer the convalescent soldiers now in that institution to other places for treatment. Although the Soldiers' Home and Hospital has been offered for this purpose, it has been refused because the chief reason for abandoning General Hospital No. 10, Parker Hill Hospital, is to make it possible to reduce the number of doctors, nurses, and enlisted men required to care for the patients.

On May 10, there were 683 patients in the hospital. Of this number, 291 will be discharged before the hospital is abandoned. There were 50 amputation cases, which will be sent to the Walter Reed Hospital in Washington, where special facilities exist for treatment and for training in the use of artificial limbs. Three tuberculous patients will be transferred to General Hospital, No. 16, New Haven, which is a tuberculosis hospital. The remaining 238 cases

are general medical and surgical patients, who will be sent to General Hospital No. 30, Plattsburg Barracks, N. Y.

**NORTHEASTERN DENTAL ASSOCIATION.**—A convention of the Northeastern Dental Association of Massachusetts was held in Swampscott on June 17 and 18. The question of amalgamation with the New Hampshire Dental Association was considered. A motion picture showing the various stages of treatment a patient receives while having teeth extracted was presented by Dr. A. S. Hovey of Lynn, and an address was delivered by Lieutenant Colonel Hugh Cabot on "Doings of the Secret Service During the War." Dr. Anna V. Hughes and some members of the staff of the Forsyth Hygienic Clinic gave a demonstration. The following officers were elected for the coming year:

President, Dr. Robert Farquhar, Lawrence; vice-presidents, Dr. N. E. Davis, Lowell; Dr. Howard Stansfield, Haverhill; Dr. E. W. Marvin, Lynn; Dr. M. E. Davenport, Beverly; secretary, Dr. F. E. Jeffrey, Salem; treasurer, Dr. T. F. Parks, Wakefield; convention manager, Dr. George H. Newell, Salem; directors: Drs. Henry Barry, Salem; Walter M. Brown, Newburyport; William C. Terenbring, Beverly; H. S. Clark, Danvers; W. H. Knight, Salem; B. B. Lasky, Marblehead; J. B. Leonard, Haverhill; James J. McVey, Haverhill; C. W. Partridge, Lawrence; H. A. Haffner, Lawrence; W. H. Pepin, Salem; M. J. Wright, Somerville; M. C. Smith, A. S. Hovey, and Aubrey A. Williams, Lynn, and Henry Yale, Peabody.

**HARVARD NECROLOGY.**—The Necrology of Harvard University for the past year includes an unusual number of physicians among its older graduates. The class of 1843 of the Medical School is represented by Dr. Kimball Hill and Dr. Edward Philippe Le Prahon. It is believed that Dr. Bertrand Francis Bugard of the class of 1839 is deceased, although there has been received no definite information of his death.

**HARVARD HONORARY DEGREES.**—Among the honorary degrees conferred at the recent Harvard Commencement, those of most interest to the profession are the awards to Herbert Hill White, Major George Cheever Shattuck, Captain Charles Davis Morgan, and Captain Walter Williamson Manton. President Lowell, in con-

fering the degrees, characterized the recipients in the following terms:

Herbert Hill White, an officer of our Army, our Navy, and the British army; protean in his usefulness during the war; who, as a business manager of the Harvard Surgical Unit with the British forces from June, 1915, until the Armistice, made possible its great achievements.

Major George Cheever Shattuck, one of our younger physicians who devoted himself without stint to the medical service of the war; first in Serbia, to drive out the scourge of typhus fever, and then in the Harvard Surgical Unit until the fighting ceased.

Captain Charles Davis Morgan. Joining the Ambulance in 1914, he volunteered in the English Army in 1915, and, save when thrice in hospital from wounds, served in the hottest fighting of the artillery throughout the war.

Captain Walter Williamson Manton. Advancing as medical officer with his battalion in the attack near Soissons, his arm was rent by a bursting shell; yet until the final objective was reached he attended the wounded and directed their removal to a safety he would not seek himself.

#### SCHOOL NURSING IN BERKSHIRE COUNTY—

An interesting experiment in school nursing has been made in Berkshire County with notable success. A recent issue of *The Commonwealth*, outlining the work accomplished, indicates the need of greater community interest in the physical requirements of growing children throughout the country.

In December, 1917 funds were provided to finance a county school nurse in towns in Berkshire County where school nurses were unknown. The coöperation of school superintendents and committees, school physicians, teachers, and parents was gratifying. The work was begun in March and continued until the close of school, about July first. During this time, surveys were made in eleven towns, ranging in population from four thousand to less than one hundred. All the schools were visited by the school nurse, and also by the school physician whenever it was possible. The nurse made no attempt to make a positive diagnosis of any obscure ailment; but obvious physical defects were noted and referred to the physician. Copies of physical records were made, parents visited, health leagues organized, health talks on personal hygiene given to pupils, and tooth-brush drills held.

Although the Massachusetts State regulation requires that the school committee of every city and town shall appoint a school physician and shall assign one to each building, in isolated districts similar to the Berkshire towns, this does not provide sufficient medical care. School inspection to be successful must be followed up by a nurse. This survey has demonstrated the need for the rural community of school nursing with adequate follow-up work, provision for dental treatment, and periodic clinics for treatments both medical and surgical.

### Miscellany.

#### STATE DEPARTMENT OF HEALTH OF MASSACHUSETTS.

##### REGULATIONS GOVERNING APPOINTMENT OF STATE DISTRICT HEALTH OFFICERS AND EPIDEMIOLOGIST.

1. *Grades.* There shall be three grades, viz: A, B, and C.

2. *Officers appointed only to Grade C.* Candidates for these positions, after passing a successful examination, shall be eligible for appointment to Grade C.

3. *Form of application for appointment.* Candidates must make application addressed to the Commissioner of Health, in their own handwriting, asking permission to appear before a Board of Examiners. Candidates shall state their age, date and place of birth, present legal residence, names of colleges or institutions of learning of which they are graduates, date of graduation, and shall furnish testimonials as to their professional experience and moral character.

4. *Age limit.* No candidate will be eligible to appear before a Board of Examiners, whose age is less than twenty-three or more than forty years. Candidates over thirty-five must have had at least three years' experience in public health work.

5. *Professional requirements.* Candidates shall be graduates of an incorporated medical school or shall have at least five years' experience in public health work and sanitary science.

6. *Citizenship.* All candidates must be citizens of the United States and preference in appointment shall be given to residents of Massachusetts.

7. *Physical examination.* Candidates for appointment must pass a satisfactory physical examination before a Board of Examiners.

8. *Board of Examiners.* The Board of Examiners shall consist of three or more members. These members shall be selected by the Commissioner of Health from the Public Health Council or other officials of the State Department of Health.

9. *Scope of examination.* All examinations of candidates shall be conducted by a Board of Examiners and the examination shall include a physical examination and such oral, written, and practical tests as the Board deems necessary in the subjects outlined in the succeeding sections. Experience and fitness shall also be rated by the Board of Examiners.

10. *Subjects for written examination.* All candidates for appointment must pass a satisfactory written examination in Communicable Diseases, Hygiene and Sanitation, Preventive Medicine, Vital Statistics, Pathology, and Bacteriology.

11. *Compensation.* The compensation of District

Health Officers and Epidemiologist shall be as follows: Grade A, \$2500.00; Grade B, \$3000.00; Grade C, \$2500.00.

12. *When promoted.* After three years' satisfactory service in Grade C, an officer is entitled to examination for promotion to Grade B. After five years' satisfactory service in Grade B, an officer is entitled to examination for promotion to Grade A.

13. *Examinations for promotion.* Examinations for promotion shall be conducted by a Board of Examiners, who shall take into account the efficiency record of the candidate as well as his professional and physical fitness. Failing first examination an officer may be given a second examination after one year. Failing two successive examinations, such an officer shall be dropped from the rolls.

14. *Term of office.* A District Health Officer or an Epidemiologist may be removed from office by the Commissioner of Health because of failure to pass two successive examinations for promotion, or because of gross misconduct or inefficiency, but only after the accused officer has been furnished with a copy of the charges made against him and given a hearing thereon by the Public Health Council.

#### NOTICE OF A COMPETITIVE EXAMINATION FOR QUALIFICATION ON THE ELIGIBLE LIST OF CANDIDATES FOR POSITIONS AS STATE DISTRICT HEALTH OFFICER AND MALE EPIDEMIOLOGIST IN THE SUB-DIVISION OF VENEREAL DISEASES OF THE MASSACHUSETTS STATE DEPARTMENT OF HEALTH.

Although the law leaves the appointment of District Health Officers and the Epidemiologist in the hands of the Commissioner of Health, it is the policy of the State Department of Health to hold competitive examinations as the principal basis for selecting appointments.

On July 14 and 15, 1919, and on subsequent dates to be announced at that time, an examination will be held for the purpose of establishing an eligible list of appointments to positions as State District Health Officers and male Epidemiologist in the Sub-division of Venereal Diseases of the Massachusetts State Department of Health.

A written examination will be held on the above dates in the examination room of the Civil Service Commission, No. 15 State House, Boston. The oral and practical examinations will be held on dates and at places announced at the time of the written examination.

In the immediate future there will be one appointment to the position of State District Health Officer and one to the position of male Epidemiologist in the Sub-division of Venereal Diseases.

Persons possessing the necessary qualifications and desiring to enter the competitive examination of this service are requested to communicate with the State Commissioner of Health, State House, Boston, at once. Upon such written application, a list of rules and regulations governing the appointment and promotion of District Health Officers and Epidemiologist and an application blank will be sent.

Admission to the examination is governed by these regulations. Physical fitness is a necessary prerequisite, but no percentage credits are given on physique. The examination comprises written, oral, and, if feasible, practical tests.

Relative rating on the eligible list is established on the basis of:

- Previous experience in public health work, both administrative and scientific—maximum, 25 points.
- Results of oral examination—maximum, 25 points.
- Results of written examination—maximum, 50 points.

EGENE R. KELLEY,

Commissioner of Health.

July 10, 1919.

# The Boston Medical and Surgical Journal

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## Address.

### ANNUAL MEETING OF THE MASSACHUSETTS TUBERCULOSIS LEAGUE, APRIL 23, 1919. INTRODUCTORY REMARKS BY THE PRESIDENT.

By VINCENT Y. BOWDITCH, M.D., BOSTON.

At this, our fifth annual meeting, we have to record some radical changes in the plans of our League in consequence of appropriations which have come through the National Tuberculosis Association to our Treasury which will enable us, we hope, to broaden greatly the scope of our work during the coming year.

During the year 1918, owing to the absence of our secretary, Mr. Seymour H. Stone, who was called to an important position created by the war and for which we felt we should grant him indefinite leave of absence, our work was necessarily hampered, although the League was busily employed in helping so far as possible matters incident to war conditions. The lectures given under the auspices of the League by renowned tuberculosis specialists to the military medical officers at Camp Devens during the winter of 1918 have already been mentioned in our last report. Efforts have been made to keep in touch with the various associations throughout the state. In regard to this latter

function I regret to say that we have not been repaid by a knowledge that all the associations were keeping up to the standard of work that we hoped for. We believe, however, that this was largely due to war conditions and that in the future, especially with increased facilities for intercourse between the outlying districts and the central office, we can all work together much more effectively. By means of the appropriation from the National Association, we have succeeded, during Mr. Stone's absence, in obtaining the services of our new executive secretary, Mr. Robert V. Spencer, who will devote his time solely to the work of the League in our new offices in the Little Building on Boylston street.

Among the plans for the future we shall develop the so-called "consultation service" already adopted by the Framingham Community Health Association, by which an expert in tuberculosis, working with local physicians, holds clinics in which doubtful cases are examined, and if found to have evidences of the disease are advised accordingly. Already plans are formulated to spread this method throughout the State, and before the end of the present year we hope to have similar clinics established in other parts of Massachusetts under the auspices of the League and with the aid of the Health Department.

It is hardly necessary to state the importance of keeping track of such cases which otherwise might easily become a source of trouble in whatever community they may happen to be.

The League now pays for the admirable services of Mrs. Staebler in the "Health in Industry" Department, an office established by the Boston Anti-Tuberculosis Association, but which extends now throughout the State. This department is accomplishing excellent results in persuading mill and factory owners to keep supervision over the health of their operatives by visits from trained nurses at regular intervals. This work redounds not only to the economic advantage of the employers themselves but to the welfare of the whole community. Of the progress in this department we shall hear today from Mrs. Staebler.

The work of Miss Hyams of the Boston Association in the so-called "Malnutrition Clinic" is now also aided by the League. By means of this excellent organization, weak children are taken in charge at hospital clinics, kept under observation by a physician, properly fed, and trained in the care of their health until brought to normal standards. We believe that this object lesson in preventive measures will be followed by similar organizations throughout our State and elsewhere in the country.

The question of the returned discharged soldiers and sailors suffering with tuberculosis is an important one before us and will doubtless in the coming months present itself more vividly as a matter that will need the attention of our League. In spite of the fact that possible exaggerated statements may have been made in the past as to the prevalence of active tuberculosis among the returning soldiers and sailors, nevertheless, many cases will be discovered which will need care. It should be distinctly understood in this connection that the government will, as far as possible, keep all active cases under its own jurisdiction. Inevitably many will demand discharge and become more or less dependent upon public support. In our position as an association of private individuals independent of state or municipal official workers and with the necessary funds at hand it seems wise at this time to formulate plans for employing some one who shall assist in making investigations in selected places in the State as to the number and condition not only of tuberculous soldiers and sail-

ors, but also of men previously rejected from service and civilians, who may be living without proper precautions and care in their communities. Plans are already being made by the Executive Committee and Executive Secretary to assist in this work of the State Health Department which, by means of "field nurses," has already begun investigations in various parts of the State.

Another feature of aid for the tuberculous soldiers and sailors has recently been under my observation, and although not coming strictly under the functions of the League, I feel impelled on this occasion to speak of it. I refer to work as a therapeutic aid in the treatment not only of thoroughly arrested cases but of those on the high road to recovery who are able to exercise for a limited time each day when under the care of a competent physician or nurse who has had experience in such matters. Most of you, I think, have heard of the Workshop and Agricultural Colony founded by the Private Sanatorium Association at Rutland, Massachusetts, a few years ago, and to which I made allusion at the last annual meeting. In my occasional visits there I have been much impressed not only by the quality of work produced by amateurs in pottery, basket making, weaving, and even carpentry, and farm work, but by the markedly beneficial effect, both mental and physical, noticed upon the cases especially selected for the purposes mentioned. Not only does the work have a therapeutic value, but economically it is successful from the fact that the articles made are a source of income to those who need the money, thus serving a double purpose, as an abstraction from the monotony of life under the usual conditions and as a means of at least partial support, which relieves the patient from the mental worry attendant upon limited means. At my latest visit quite recently I was more than ever impressed and I have had the additional satisfaction of conversations with several discharged soldiers and sailors who are now in private establishment, at Rutland and who, although not entirely arrested cases, are in excellent condition and who are able to avail themselves of this Workshop and Agricultural Colony. What is of still greater importance to my mind, however, is this fact, that in the work of rehabilitation of our soldiers and sailors we can, with confidence, urge upon the na-

tional associations devoted to the welfare of our military and naval men invalidated for a time, the wisdom of not only supplying *avocational* work but many modified forms of instruction in *vocational* work to those who are in sufficiently good condition to undertake something in their own special line with infinite benefit to them in more ways than one.

I have had the privilege during the past few months of serving on a joint committee of the National Tuberculosis Association and the Federal Board of Vocational Education in Washington with special reference to discharged soldiers and sailors. The Vocational Board has promised substantial aid to the support of schemes which offer work for cases of arrested tuberculosis. After conversation with these invalidated men and with Dr. R. T. Crane of Rutland, who has had them under his supervision, I would certainly advocate an extension of the Vocational Board's limitations and urge them to offer help also to such cases as are deemed capable of work during their treatment, even before perfect arrest of disease is attained,—proper supervision, of course, being a *sine qua non* of such proceedings. To give a concrete instance, to make my meaning more clear,—my conversations with several intelligent men, discharged tuberculous sailors, one a plumber, another an electrician, and others of similar occupations, convinced me that if teachers in these various departments could be supplied, it would be a distinct advance not only in making the men feel they were working for their future development in their own special branches, thus giving them the mental stimulus so important for their well being, but, economically speaking, a better class of workmen would be evolved. By what I have said I should not wish to be understood as relaxing in my belief that all such measures must be undertaken with the utmost caution in every case. But, given the proper institution, and given the proper men to control it, I believe that much more, infinitely more, can be done for the welfare of our patients, both civilian and military, if these facts are known and acted upon. I will not ask your pardon for emphasizing these matters which, perhaps, are not strictly under the direct jurisdiction of our League, but partake more of the medical aspect of the question. It involves so much that is really of public interest that I am desirous of bringing my

own opinion before you who are all interested in anti-tuberculosis work in all its phases. Fortunately we shall hear this afternoon from Dr. Crane, who will give us the practical results of his long and thorough study of this particular feature of anti-tuberculosis work. I wish to urge everyone present, however, to visit Rutland and observe a private enterprise which I believe to be fraught with benefit not only to our State but to the whole country, if the methods employed there receive the generous support which they deserve. To my mind no philanthropist can put his money to better use than in developing this form of anti-tuberculosis work.

I wish also to speak again of another phase of anti-tuberculosis work which should interest philanthropists, *viz.*, the establishment of sanatoria for what has been often called "the middle economic group," that is, the people who do not wish, for one reason or another, to accept state aid such as is excellently given in our state and municipal sanatoria and hospitals; people who can afford to pay more than the price asked at these institutions and yet cannot possibly meet the expense of those intended for the wealthy. At the present time there is, as is well known to many tuberculosis specialists and emphatically expressed by them, a lamentable lack of proper accommodations for this class of patients, and it is only by continual reiteration of this fact that we shall meet one phase of the tuberculosis question and make the public realize its importance. This necessity has been questioned by a few, apparently on the ground that comparatively recently in some of our state and county institutions there have been a few empty beds. Such statements in no way weaken the force of what has been stated and only begot the issue. It should be distinctly understood that recent efforts to supply this want in our State and elsewhere are intended for a different economic grade of patients, and are in no way meant to interfere with the admirable work done by our state and county institutions. The intention is merely to fill the gap which exists between accommodations for the very poor and the very rich, and to help the class who will not consent to accept state aid yet need the privacy and more homelike conditions of private institutions where, for moderate prices, these conditions can be found. Speaking for myself, scarcely a

week elapses that I am not appealed to by people who desire such places and I find it often impossible to get what I wish.

The recent endeavor to interest the public in the erection of the so-called Central New England Sanatorium at Rutland, which is intended for this class of patients, has met thus far with the most gratifying success. In these trying times of war taxes, "Victory Bonds," and innumerable calls to relieve distress in Europe, the money already subscribed and the interest expressed show that the public is becoming aroused to the necessity of meeting this problem in every way possible.

I cannot close these remarks better than by quoting the words of one of our most brilliant and most scientific of the younger workers in tuberculosis when he says: "The opportunity for service in anti-tuberculosis work is tremendous; so tremendous as to appal the individual who for the first time casts his eye over the fields to be made over and the roads to be leveled. The opportunities for philanthropy are no less great and in no human endeavor will money spent yield more certain and richer returns. We must have a goal and this goal must be the complete taking over of money and money and still more money, and never cease until the mass of mankind realizes the situation and is responding to it. Then, and then only, can we say that we are in a position to wage a real battle against tuberculosis." Such words coming from one of the younger generation bring fresh courage and enthusiasm to those of us who have grown gray in the fight against tuberculosis. May they stimulate the members of our League to ever-increasing vigor for the work before us.

### Original Articles.

#### PSYCHIC MANIFESTATIONS PRECURSORY TO MENTAL DISEASE. WITH CLINICAL PRESENTATIONS.\*

BY ARTHUR H. MOUNTFORD, M.D.,  
AND  
WILLIAM J. VIVIAN, M.D., WORCESTER, MASS.

MODERN progress in mental analysis has given many the hope of effecting an amelioration or cure of some of the minor psychoses. Papers of a general nature dealing with the

principles of mental analysis are found to be very frequent, while citation of specific cases well analyzed are not by any means so often resorted to as it really should be. In this paper, therefore, we have taken up two cases and will endeavor to present the analysis in a clear manner.

It seems that the general principles involved can be better presented by a more extended analysis of one or two cases than by the brief and superficial reading of many such cases. Of course, no two cases of the sort here considered are exactly alike. There are many types with many sub-divisions within each type. In many cases there is a definite doubt between a psychosis and psychoneurosis. Some cases which seem purely psychoneurotic run a definite course with recovery much as do the manic depressive cases. In many of these there is a real danger of suicide and other complicating factors. All that we endeavor to offer is a fairly thorough presentation of two cases of the so-called psychasthenic group.

The first case presented is that of B. C. M., an American, nineteen years of age, who was admitted to this hospital as a voluntary patient February 12, 1919, and discharged at his own request March 7, 1919.

*Family History.* Because of certain peculiarities of the family, which will be described more fully, it has been impossible to obtain a complete family history. However, there is enough evidence to show that the young man has had the disadvantage of an unfavorable environment, at the least, if not that of a tainted ancestry. The family consists of father, mother, one brother and sister, and the patient. Of other relatives, either maternal or paternal, little is known outside the fact that one cousin on the paternal side is said to be insane. The father is described by his neighbors and others who have seen him as a peculiar man and is known to the hospital physicians through his visits here, at which times his circumstantiality and rambling way of talking was noticed by them. He has been employed for many years in farming and wood cutting, working in various places in Rhode Island, Connecticut, and Massachusetts. The mother is several years younger than the father, and is also described as being peculiar. Some years ago she had a nervous breakdown, the exact nature of which is not known. The

\* Read at a meeting of the Worcester District Medical Society at the Worcester State Hospital, Worcester, Mass., April 16, 1919.



sister is a few years younger than the patient, fairly industrious in school, and a good worker at home. She is unusually bright, but of peculiar appearance and actions. The brother, a year older than patient, has acted peculiarly for a long time, which has gradually become more noticeable to those acquainted with him. During the patient's stay in the hospital the brother was admitted in a decidedly katatonic stage of confusion and excitement. He improved only slightly and was later sent home on a visit against advice of the hospital authorities. The home is a fairly pleasant and neat appearing place of good size, and shows the effect of some thrift and industry. All those who have known of the family,—neighbors, school teachers and others, have spoken of their seclusiveness and asocial nature. As far as known, they never have any recreation outside of the home, have no church affiliations, and do not care to have any visitors in the house; in fact, they have been known repeatedly to have refused even to answer a bell or knock.

*Personal History.* Patient was born in Rhode Island. He had the usual children's diseases such as measles, mumps, and chicken-pox. His school life began at about six years of age and continued until he was fourteen. During this time he finished six grades and was in the seventh when he stopped going because of lack of confidence in himself, inability to concentrate, and a keen sense of embarrassment when speaking or reciting lessons. One whole grade was lost because of nervousness. After leaving school he worked on several farming jobs intermittently with mill jobs, the latter being given up usually because of fear that inside work was injurious. Length of time employed on any one job was usually two to three months. There is a history of masturbation beginning at fifteen years of age, practised as frequently as every day or every other day for first year and decreasing from then on. Other than this his habits have been very good.

*Physical Examination.* Of no particular interest. Neurologically there was found to be a slight increase of the left knee jerk over the right. There were no pupil disturbances and no irregularities of any type. Blood serum negative to the Wassermann test.

*Hospital History.* During his stay in the

hospital this young man always presented a neat appearance and carried himself well. He was inclined to be rather asocial and preferred to amuse himself by reading, walking about the grounds and playing the piano, which he could do only fairly well. He would do a little of the ward work when requested to do so, but never volunteered. There was one habit he had of continually stopping the physicians to speak of his somatic sensations which were numerous and require more discussion.

A mental status taken during residence saw him well oriented in all spheres with a good grasp on his environment. Memory for both recent and remote events seemed not at all impaired. Such schooling as he had seemed fairly well retained, but his grasp on current events was rather superficial and meagre. Reading not unusual. Writing accomplished in rather childish hand. The following characteristic symptoms of neurotic type were elicited:

From early school days there has always been a fear of talking to people, more particularly strangers or mere acquaintances. This apparently arises from a paucity of ideas when attempting conversation and the idea, somewhat vague, that his mind is like an open page. During a conversation he flushes, gets excited, and cannot express in words what thoughts he may have.

There are feelings of unreality of things in general, at times, a sensation of having no past or future and only a nebulous, floating present. There have been some compulsive ideas in the past, such as a desire to count all steps ascended, to step over cracks on the walk, to touch each post passed without fail. These are described as not mere whims, but as actual compulsory feelings.

There are feelings of fear expressed for many conditions, one of which is quite typical of the anxiety neurosis group. On returning home after a stay away of any duration there is a fear for the health of the family, he feels shaky and his anxiety for their health is very keen and not overcome until he actually enters the house and greets his folks. There are several somatic sensations complained of, chief of which is a feeling described as a pain in the left hypogastric region. This is believed by the patient to be incurable, or at least a condition that no one has been able to relieve him of.

He often has the feeling that his lower lip is dead or paralyzed and droops in the middle.

He complains of feeling hungry all the time, says that a half hour after eating a meal he is so hungry that he craves another full meal over again.

No hallucinations either of an auditory or visual type are admitted, neither are there any delusions of persecution, occult, or electrical influence, poisoning, etc., elicited. There have been some ideas entertained by the patient, vague and not deeply grounded, that possibly might be called delusions of reference, in which he thought that others might be talking about him or saying something about his family.

There is considerable insight expressed and the patient realizes that he does not react normally to the different conditions of the outside world.

In summing up, the seclusive traits and peculiarities of the family, plus a definite psychosis in another member, also the continued effect of this environment, all form an etiologic basis to be considered.

The neurotic and psychogenic manifestations are fairly numerous and are expressed in certain fears, anxieties, and morbid feelings. Compulsive ideas and altered somatic feelings, anesthasias, tinglings, and vague pain sensations help complete the picture.

Differentiation from an actual psychosis may not always be possible, though in this case the absence of any hallucinations, or delusions of persecutory trend or of other ideas concerning external influence, also the absence of a definite depression or excitement with the presence of considerable insight would rule it out.

The next case is that of a man who by inheritance has been predisposed to a weakened nervous system. His symptoms began to appear at the period of sexual development and he was constantly under the guiding hand of an over-sympathetic parent, who catered to his every whim. He is the type of man who is unable to stand any exhausting strains and is defective in his recuperative powers. His life has been one of continued effort, without proper exercise and harassed by worry which the struggle for success entails, until finally he gave himself up to a condition manifesting itself in errors of judgement and an abnormal emotional state which has led to unwarrantable fears and a state of anxiety.

The patient, W. H. S., had a previous hospital residence at the psychopathic department of the Boston State Hospital from October 4, 1917, to October 11, 1917, and at the Westboro State Hospital from October, 1917, to August, 1918.

*Family History.* Father and mother living and well at the age of 73 and 71 respectively. Paternal uncle was at one time in Waverley suffering from a mental breakdown. Maternal grandmother had epilepsy and was also at Waverley.

*Personal History.* Patient was born in Boston in 1871. Began school early, did not finish grammar school, but went to Chauncy Hall, from which he graduated at the age of 19. Attended the Massachusetts Institute of Technology in the Biological Department for five years, graduated in 1894. Went to Harvard Medical School and graduated in 1899 and received an appointment at the Massachusetts General Hospital, but could not keep up the work there and was given a chance to resign from service. Then he started to practise in Dorchester, remained there about four years. From Dorchester he went to Wayland. He gave up practice in 1905 because of despondency, worked for a while with his father in the office. During the winter of 1906 he returned to the Institute of Technology, taking a special course in sanitary chemistry. In the summer of 1907 he went to Dublin, New Hampshire, and worked in a laboratory. Remained there a year or two. Came back to this State and resumed practice for six months when he again gave it up and was a second time employed by his father. In 1897 while in Harvard, he had an attack of nervous prostration and it was necessary for him to go to the Ring Sanitarium. He also had treatment under the Emmanuel Church Movement and also took suggestion treatment. In June, 1917, became a voluntary patient at Waverley: remained there until August. After leaving Waverley he went to Maine where he worked in a store in a lumber camp for about a month. Upon his return he entered the Psychopathic Hospital. From there he went to Westboro, and finally, here to Worcester. There is a history of masturbation since puberty.

Came here on regular papers. Was a neat appearing man of 40 odd years. Answered

questions readily and willingly, but was inclined to be self-accusatory in his remarks.

Physical examination of no particular interest. Blood pressure 126 systolic, 80 diastolic. No neurological irregularities. Wassermann reaction on both blood serum and spinal fluid negative to the test for syphilis. Urinalysis negative.

Since being here he has been up and about the ward daily. Follows the physician around at each visit with some new idea that he thinks he should be punished or condemned for doing imaginary things. He walks about the ward aimlessly all day, occasionally has attempted to employ himself in the industrial department, but his work is of a very poor quality.

Patient is correctly oriented in all spheres. Has a good grasp on his surroundings. Memory for both recent and remote events is unimpaired. Intellectual deterioration has been very slight.

The patient's ideas are all centered about himself. He has a constant fear of punishment for things he imagines he did. This fear that he may have done something wrong arises long after the act has been committed. These fears are the burden of his complaints. Says that he has always been a cheat, both in a business way and during his courses at school, has been a fraud all his life. He does not think he has been honest with the world or with himself. At times he has doubts as to the legality of his marriage. While in Maine he thought he knew of a boat that had a hole in it, he did not say anything about it and he thinks many people may have been drowned because he did not tell about it. At that time he thought people suspected he had stolen stuff from the store where he had worked. This was brought about by the fact that a case of goods which had been received was broken and some of the stuff scattered about, the same was nailed up and labelled, put on a barge, and a day or two after he saw some labels floating around in the water, thought these labels came from the case and thought he was going to be held responsible for the same. Feels that he has caused the death of a great many people and says that he has always exaggerated things. While practising medicine he prescribed calomel which contained corrosive sublimate. Thinks that while the physician here was drawing blood for the Wassermann

test he infected the physician and that he will shortly be responsible for his death. Feels that he obtained money from his father by misrepresentation. There seems to be a great deal of doubt in his mind regarding this matter. However, says that one time his father gave him a check for a sum of money and when he indorsed same he got the idea that he also indorsed his father's name on the check and this has caused him considerable worry. At first he excused himself, but now feels that he should be committed and probably put out of the way.

This patient has never been competent, has always been unable to cope with the ordinary conditions; has never been self-supporting, wholly dependent on his father before his marriage and since that time has relied upon his wife. Says he has never been able conscientiously to say he has stood on his own resources. He attempted to do chemical work after his graduation at M. I. T., and later practised medicine after leaving Harvard. He once wrote a play on Southern life. It was put on through influence for one night, he taking the leading part, but it proved to be a flat failure. Thinks we should allow him to go home, contract pneumonia and die, as he is of no use in this world; but, on the other hand, he states he is afraid of death. Feels that former blood examinations done at both the Psychopathic and Westboro hospitals and reported as negative were mismarked, and vaguely believes that he is suffering from syphilis.

At intervals he seems to be somewhat agitated and at other times a little might depressed. On a few occasions he has felt that he has infected the faucets, towels, etc., with excreta and by this means has transmitted diseases to other patients. Sometimes he has seen white dust on his coat which has annoyed him greatly, thinking it was poison placed there intentionally. Oftentimes comes complaining to the physician that he has a great antipathy for the others in the ward and wishes them to be kept away from him. Is very remorseful over the fact that he found T. B. signs in his wife's lungs and has never done anything for her. He never converses with the other patients, neither does he enter into any of their forms of amusement. Occasionally he will be found reading the daily paper. Attempts to care for his own

room, such as making the bed and sweeping, but the work is of such poor quality that it has to be done over by someone else. He admits two attempts at suicide, first at home when he says he tied the cord of a bathrobe about his neck, but this broke before he could carry out his intentions; second attempt was at Westboro State Hospital. While there, broke pane of glass in a framed picture and used a sliver of this to make two punctures in his wrists; he lost considerable blood. Previous to this attempt he had written a farewell note showing that while the act was clumsily performed it was premeditated. However, as soon as the blood began to flow briskly he rushed out on the ward and showed himself to the nurse.

These symptoms point to a psycho-neurosis with a secondary phenomenon of depression, the whole making a state in which the patient is practically inefficient: no definite hallucinations, he has morbid doubts, a good deal of scattering of interests, he is somewhat apathetic, has periods of agitation and depression, not deteriorated, has a feeling of inadequacy and a marked anxiety regarding the ultimate outcome of his trouble.

We feel that the eight years of tremendous study and stress in a technical institution and a medical college, added already to the unstable make-up of the individual has allowed him to drift into a condition which is greatly allied to a definite psychosis. It is fair to presume that had this patient, coming from tainted ancestry, been educated along other lines, where his struggle for success would have been a little less, he might today be a self-supporting individual.

## BLOOD TRANSFUSION IN WAR SURGERY IN THE BRITISH ARMY.

By E. GRANVILLE CRABTREE, M.D., BOSTON.

*Major, R. A. M. C. (Harvard Unit); Surgeon in Charge of the Surgical Division of 22 General Hospital, France.*

AMERICAN ideas and methods in transfusion of blood were not, apparently, generally familiar to the British war surgeon previous to the war. To be sure, transfusion was done in England in civil surgery, yet its use seems not to have been at all extensive compared with its

frequency of use among American surgeons of the same period. Most foreign surgeons, I believe, in England and France, at least, have preferred the syringe method for indirect transfusion and were not familiar with paraffin-coated tubes. In most instances 400 to 600 c.c. of blood was thought sufficient for a patient. Citrated blood was given.

Records of the Harvard Unit show that transfusions by the Vincent modification of the Kimp-ton-Brown tube were done by Vincent in 1915. More transfusions were done in 1916. During this period the British army surgeon was not doing transfusion. From 1917 until the signing of the armistice, the period in which greatest pressure in numbers of wounded was placed upon our hospital, we found it necessary to establish and maintain a special transfusion team in a special theatre. Patients were more promptly treated by this arrangement with great benefit to mortality statistics and without interfering with work in the main operating room. This latter consideration was important. Patients arriving in extremely poor condition were taken there immediately, then sent to the main operating room as soon as safe operating margin was established. Cases in poor condition from recent hemorrhage or post-operative shock were sent for transfusion before being taken to their wards.

The need of transfused blood is, of course, greatest at front area hospitals. In 1917, Harvard Unit teams were first sent to casualty clearing stations. These teams were equipped with Vincent transfusion tubes and did several hundred transfusions. Other American surgical teams arrived as fast as American units reached France, all similarly equipped and familiar with the value of blood in the type of cases coming to the surgeons in these hospitals. Several hundred to 1,000 c.c. of blood was being given instead of 500 to 600 c.c., repeated transfusion was seen to be of great value, and the paraffin coated tube demonstrated to be more rapid and therefore a more efficient means of giving blood than either citrated blood given by gravity or the syringe method of direct transfusion.

The opposition to transfusion at first shown by army authorities, because of the belief that slightly wounded, therefore available, men were being incapacitated by serving as donors, was short lived. Arrangement was soon made and notice published in general orders that donors

should receive two weeks' regular leave for giving blood. The men, of course, had never refused to give blood when blood was required, and giving of leave for "a little blood" only popularized it. An Australian sergeant from a regiment lying in support of the Canadians at Cambrai came to me one morning to say that his *whole company* would like to be used as donors. Donors have never been unobtainable.

During the winter of 1917-18 transfusion was put on a firm basis in the British Army. Arrangements were made in London and Paris for the manufacture of transfusion tubes for the Army and a supply sufficient for its needs maintained. Casualty clearing stations and base hospitals were equipped and the surgeons were instructed, where necessary, in the technique of grouping blood and transfusion. Clearing stations had special transfusion teams either in their resuscitation wards or in a special "transfusion tent" which, working day and night shifts when necessary, did large numbers of transfusions and intravenous injections of fluids. The number of lives saved by transfusion during the fighting of 1918 alone is very large. In a single casualty clearing station thirty-five to fifty transfusions each twenty-four hour period are common during active fighting.

In the interval between the rushes of wounded these hospitals were allowed to keep fourteen grouped donors on light duty about the hospital as a nucleus for transfusion work at the beginning of the next rush of wounded.

Transfusion on so large a scale as was that in the British Army during 1918 has given facts about the value of blood and the comparative value of fresh blood and fluids intended as substitutes for blood which will be of value in the treatment of accident cases in civil life. One needed but to enter a resuscitation ward in any front area hospital during active fighting to find any type of hemorrhage and shock case ready at his hand and often in excess of his ability to cope with comfortably. From these cases experience soon demonstrated where effort could be expended with most profit and where transfusion was unjustified. Of the many factors contributing to shock, in wounded men in field hospitals under the rush of war conditions, it was found possible on a large scale to combat pain, loss of blood, cold, hunger, and physical exhaustion. These factors were usually all present in front area cases. In unoperated cases arriving at the base hospital one

usually found the patient had been fed and had not recently been subject to extreme cold. Poor condition was usually due to loss of blood and the added factor of sepsis. In some instances loss of blood was remote, occurring at the time of injury, yet the patient had had a safe operation margin, had survived operation in the front area, yet the added burden of sepsis had been sufficient to wreck him. In other instances moderate loss of blood at the time of injury when accentuated by thigh amputation with a wide open septic stump produced a total which gave to the patient the appearance of profound hemorrhage. Thigh amputation was always to be considered as a serious loss of blood in a badly hit man in poor condition.

Pain as a rule was early attended to immediately a man reached an aid post in the front areas. He was given morphia often in large doses and broken bones fixed. Yet chest and abdominal cases as well as fracture cases found ambulance hauls over rough roads trying and arrived not only in great discomfort but in very poor condition. Warm food or drink helped all. Shock cases often showed rapid recovery on fixation, morphia enough to give sleep and heat. Without these all attempted restorative measures fail. In severe shattering injuries to bone where fixation is next to impossible, early operation followed by immediate careful treatment of shock was clearly more profitable than awaiting a long slow recovery precarious throughout its course. An hour's heat and morphia and 700 c.c. of blood almost invariably gave a safe operation margin. Five hundred c.c. more blood immediately following operation restores the patient to something near his pre-operative condition.

We have believed that our cases were better risks after scopolamine given one hour before operation. This drug has the advantage of saving a badly wounded man the sight of army operating rooms, which is disturbing. The patient almost always stated next morning that he did not remember much about his surgical experience.

Considerable information has been accumulated as to the relative value of fluids intended as substitutes for fresh blood. The intravenous use of saline was unsatisfactory and even harmful. Subpectoral injections were unsafe. Slight improvement, noted immediately following intravenous saline, was most often followed by collapse within a half hour to a condition as

bad or worse than before it was given. Gum and glucose solutions are useful but are *not* substitutes for blood. They are retained in the circulation for sufficient time to enable some patients to maintain their gains in condition. Bicarbonate of soda in glucose solution has proved of inestimable value when given alone or together with transfused blood in severe gas gangrene cases, particularly where vomiting is present.

As a result of treatment of severely wounded in the British Army, the following routine was at the termination of the war considered to afford the severe case his best chance of recovery:

In front areas where shock predominates:

1. Cases which arrive at hospital in poor condition but not in extreme shock, which show little improvement from a half to three-quarters hour of rest, heat, fixation and morphia should receive 700 to 800 c.c. of bicarbonate of soda in glucose or gum solution. For many this treatment is sufficient. These cases usually have lost little blood, yet, if not carefully cared for, may be lost.

2. Cases showing little improvement after intravenous fluids demand immediate blood transfusion. A second intravenous fluid is unwise. Transfusion insures a wider margin of safety for operation in these cases which at best must be considered doubtful surgical risks.

3. Cases in extreme shock, particularly where there has been some loss of blood and where amputation may be necessary, require immediate transfusion and usually do best on early operation. Patients in extreme distress, as from crushes with loose fractures, will not show much improvement until pain is relieved,—a difficult accomplishment by anything other than removing the cause by operation. Unoperated, complete sudden collapse with death may intervene at any stage. I have found it safer to operate immediately the patient was warmed a little. In bad cases operation and transfusion were done simultaneously. My nurse did the transfusion if other assistance was unavailable. A striking thing noted by a number of observers is that after a patient has been allowed to sink into a condition in which life is almost extinct he will remain for days or even a week or more so narrowly balanced that a painful dressing may almost cause collapse in a man who at

other times looks very well indeed. These cases often carry high pulses for many days, although neither a marked decrease in hemoglobin nor sepsis be present. Even moderate length operations carry a high mortality in these cases. It is better for the patient to be put to bed *immediately* his condition begins to change for the worse, if the nature of his wounds will permit, and to bring him out a few hours later. I have operated three successive days on one man with severe multiple wounds, transfusing 700 c.c. of blood after each operation. This patient may not be a pleasant looking relief of the war, but his life was saved.

4. In apparently moribund cases where loss of blood has been extreme, immediate transfusion of 1000 or even more (I have used up to 1300 c.c.) is indicated. Transfusion may be technically difficult owing to collapsed veins. Saline can, however, usually be forced in. Three hundred to five hundred c.c. of saline may be given while the Vincent tube is filling. The presence of this quantity of fluid in the veins often decides success or failure of the attempt to force blood into collapsed veins. Experience has shown that for most of us attempts to judge as to what cases are hopeless are unsafe. Remarkable recoveries are common. At Amiens three hemorrhage cases arrived at my tables practically simultaneously; all were urgent. Three transfusions, perhaps not done aseptically, two running at one time, were done with two recoveries.

5. Patients with severe wounds but offering a safe operation margin, who survive operation in fair condition, often fail and die the second or third day with the onset of sepsis. Seven hundred to 800 c.c. of blood and the free use of intravenous bicarbonate of soda in glucose will tide such cases safely over.

6. Abdominal cases where shock is extreme from loss of blood into the peritoneal cavity due to wounds of large mesenteric vessels or liver, if opened quickly and the hemorrhage controlled, then transfused while the operation on the abdomen is being completed, will leave the table in better condition than when they entered the operating rooms.

In base hospitals farther from the line than the casualty clearing station shock is second in importance to sepsis. In the latter hospitals

hemorrhage and shock are the indications for blood, while in the former, recent or remote loss of blood and sepsis are the indications for transfusion. I believe that blood alone is indicated in these cases except in so far as bicarbonate of soda in glucose in addition to blood is indicated as a special measure to combat the toxicity of sepsis. I believe transfusion to be indicated in the types of cases seen in base areas for:

1. Anaemic cases, anaemic from previous loss of blood, amputations, sepsis or a combination of these, which have open wounds which will require to heal by granulation. These patients show rapid pulse and dry wounds. Seven hundred to 800 c.c. of blood will produce marked change in the patient's general condition and the rapidity with which his wound becomes red, moist, and granulating.

2. Anaemia, often seen in multiple wound cases when none of the wounds are severe, yet all are septic, is a well known war condition. The patient is pale and wastes away. He runs a swinging, irregular, septic temperature chart and a high pulse. Repeated transfusions of 500 to 600 c.c. of blood is followed within a few days by maintained normal temperature and pulse and marked improvement in general condition of the patient. Wounds become moist and discharge pus more freely and soon granulate.

In these cases metastatic abscess, appearing in a few days after transfusion, are not uncommon. I believe this occurrence of abscesses neither to represent new foci of infection nor faulty technique but to be due to the patient's increased ability to form pus about foci of infection already existing.

3. Post operative hemorrhage in deep subsiding gas-infected wounds, occurring days after the primary operation, has been the trial of the war nurse and surgeon alike. The contrast in appearance of the bled out patient who reaches the operating theatre, and the same patient half an hour later as he returns to his ward, has done much to popularize transfusion in the British Army.

Experiences of this war have only given further proof that transfusion is of no value whatsoever as a curative measure in septicemia.

## OCCUPATIONAL THERAPY.

By BAYARD T. CRANE, M.D., RUTLAND, MASS.

The public and medical profession of Massachusetts appears to be quite uniformly educated to the necessity of sanatoria and hospitals as the mainstay of successful treatment of active tuberculosis. Such medical institutions will doubtless remain of prime importance until that invisible day arrives when a new discovery will displace the hygienic method of treatment of the disease.

This paper assumes that medical institutions for the treatment of tuberculosis are essential at the present day. A great responsibility, therefore, rests upon these institutions in electing to harbor a great group of suffering humanity.

These patients will possess all degrees of intellectual power; all shades of moral and spiritual force; all degrees of ability to suffer mental anguish on one hand, and to participate in enjoyment on the other. They will not only possess all the ability to suffer and to enjoy, and all the power to sin and saint, but they can be depended upon to react to suffering, enjoyment, sinning and sainting, according to the familiar laws of all human beings. In the words of Shylock,—have they not,—

"Hands, organs, dimensions, senses, affections, passions? Fed with the same food, hurt with the same weapons, subject to the same diseases, healed by the same means, warmed and cooled by the same winter and summer" as an ordinary mortal is?—(Merchant of Venice, Act III, Scene I.)

In them pain will create outcry or fright. Monotony will produce depression, discouragement or desperation. Uselessness will break down initiative and ambition. A morbid environment will cause depression, perhaps desperation and perhaps departure. An ugly environment will create restlessness. Family and financial worries may wreck the treatment altogether.

To handle successfully the various natures that come to a large sanatorium requires a rare, variegated, chameleon personality on the part of the administrators, and the task is rarely accomplished by any of us. We meet trying cases where the friends, the family, the clergy, the nurse, and the physicians, all to-

gether, may fail utterly to hold the patient at his task of getting well.

An intelligent psychological study of the extreme cases would doubtless reveal many actual abnormal personalities wholly unrecognized by the family and physician, but how can the overworked and undermanned medical staff go into all these intricacies? No,—the physician's main function, he may say, is to heal the lungs. His first and great commandment is that "fresh air, food, and rest will cure the disease." These are the fixed established rules of the sanatorium, and the patients are expected to adhere to them, and in the language of a prominent specialist (shall I say of the "old school"?!) "If the patient has not the moral stamina to stand them, then that is his loss and lookout."

I am not pleading for a modified method of treating tuberculosis, so tame and so softened as to be actually devitalizing. I am rather speaking for an addition to existing methods of treatment of tuberculosis which will expand the scope of the treatment so as to help to meet the individual patient more on his own terms, if possible, and so as to enroll the co-operation and interest of a larger proportion of them. I am pleading for a method which aims to further individualize with the temperament of each patient so he may submit to and endure the severe requirements of the treatment through the long, long period of time necessary, and which aims to satisfy the family and friends that unusual efforts are being made to make the treatment tolerable to the patient. It is an attempt to instill in the treatment enspiriting influences created by diversion, by occupation of mind, by stimulation of flagging interests, and reëducation of faith and self-confidence. It is a rare patient who is sufficiently resourceful to be self-propelling, so to speak.

In short, occupational therapy,—for this is perhaps the best name of the procedure for which I speak—has proven itself of sufficient value to be included as a remedial agent of considerable importance in institutions for the treatment of tuberculosis. The fact that an institution commits itself to occupational therapy indicates that the institution is feeling a keener responsibility toward the personal problems of the patients.

Let no one assume that occupational therapy

will be effective in all cases, nor that it is a simple task to install, organize, and continue a model department of it. But fifty per cent. (50%) of the rank and file of patients can be expected to participate in such a system and in a small per cent. (not over 5%) some very strikingly beneficial results will be obtained from it directly. Some instances will occur where long lasting fever will fall to normal directly as a result of the method. It can be prescribed frequently by the physician to curb the restlessness of fiery and temperamental patients. It is frequently educational along esthetic lines, thereby inciting a new cultural interest in the patient's life that might well become an avocation. It may possess the element of surprise or may stimulate mild rivalry between patients. It is within proper limits, restful, because a change, and it helps to kill time." It brings the patient in contact with a person (the instructor) whose interests are those of the outside world, and it thereby makes a break in the treadmill of invalidism. It makes the patient a creator, a doer, and not a parasite. It assists in improving discipline in difficult cases, and is a preventive against some of the mischief which idle hands may find. It broadens the bond of interest between the patient and his overseers. It creates interest and mental development by its progress from the known to the unknown.

Hand-made pottery, hand-loom weaving, basketry, and wood-carving have afforded the most useful and suitable forms of occupational therapy thus far for our patients at the Workshop of the Rutland Private Sanatorium Association.

#### INDUSTRIAL SANATORIUM.

If occupations have advantages for purposes of treatment as just described, the question will naturally arise, "Can not occupations for patients be made to serve a larger purpose? Why can not occupations be made utilitarian as well as therapeutic? Why can they not be made remunerative so as to reduce the cost of maintenance? Why can they not be educational so as to help prepare the patients for a new or altered occupation which he may have to follow after discharge.

An experiment has been carried on in Rutland, Mass., under the auspices of the Rutland Private Sanatorium Association, for several years. The institution started as an agricultural



and handcraft colony to advance the physical, mental, and economic welfare of convalescent tuberculous invalids. The movement has been diversional, curative, educational, and economical. The plan operates as follows: During the early stages of sanatorium treatment the patient is provided with occupational therapy in the form of weaving, pottery, basketry, and wood carving, etc. This is carried out either in the pleasant workshop, to which certain patients are transported by automobile, or at the private sanatorium, if the patient is confined to bed, and unable to travel. Our aim has been to specialize on crafts that were remunerative as well as therapeutic. Products from the hand looms answer these requirements perfectly. Saleable rugs, ladies' hand bags, table runners, and bed spreads have been produced. By the time the patient spends ten hours per week at one of these crafts he becomes an asset to the workshop. That is, ten hours of his labor per week are worth what it costs to instruct him, transport him to the building, plus his share in general expenses. He, therefore, is entitled to compensation for any work over ten hours per week.

Inasmuch as he should be able to work four, or more hours a day before he is in condition to leave the sanatorium, it is apparent that he may be able to earn a tolerable return from these crafts while still taking active treatment.

But patients' labor is valuable in many ways other than in hand crafts, as in household and office, automobile, care of grounds, publicity work, etc. In fact, it has become apparent that occupation of convalescent patients is advantageous in so many ways that we have established an industrial sanatorium which is operated as follows:

When a patient has improved to the point that he is able to exercise about two hours a day, he is eligible for transfer and admission to the industrial sanatorium, provided he has absorbed the knowledge of how to live properly and provided it is important for him to reduce expenses of treatment. The industrial sanatorium combines opportunity for hygienic living with opportunities at self help through occupation. The living cost is remarkably low since the patients, being convalescent, can thrive on simple food, and also because the necessity of nursing and medical supervision is markedly reduced, and bed treatment is not

required. The patients realize the plan is co-operative and willingly assist in many tasks which reduce expenses. The patients are anxious to be admitted so as to get away from the air of invalidism pervading an ordinary sanatorium, and because the rigidity of rules common to sanatoria is somewhat loosened. Then, too, there is the diversion from being occupied, as well as the gain that comes from payment for any work performed; also the opportunity to test one's strength at actual tasks preparatory to a return to ordinary occupations. If necessary to continue hygienic life for a period of years, the plan offers a maximum number of advantages.

The plan improves the morale in the ordinary sanatoria because patients realize that only proper conduct while there will make them eligible to the industrial sanatorium.

The varied occupations attract the family of patients also to a degree, and thus enable the family to be brought together under model, hygienic conditions, and under adequate medical oversight. Perhaps the greatest single advantage of the plan is the inducement it affords for patients to remain under treatment for a much greater length of time. This, then, alone perhaps justifies the entire scheme.

About ten per cent. (10%) of my patients were being treated in the industrial sanatorium in the year 1918, and the average cash earnings per patient per week was \$12.04. The weekly cost of maintenance ranged between \$10 and \$12. (The per capita cost at the State Sanatorium, in 1918, was \$13.78 plus.) It is thus seen that about 10% of these patients were able to support themselves while taking treatment. If this system were to be adopted by the State and the same result obtained, it would mean the elimination of 10% expense.

#### RESIDENTIAL OCCUPATIONAL COLONY.

Our plans call for an expansion of the industrial sanatorium idea to the establishment of a residential occupational colony, or a tuberculosis town, with a variety of industries, both indoor and outdoor, with model living quarters for the worker and his family if desired, and with the necessary amusements, educational, and religious facilities, and all under adequate medical supervision at a distance from congested districts and the sea coast.

## Medical Progress.

### REPORT ON DERMATOLOGY.

By JOHN T. BOWEN, M.D., BOSTON.

#### RECENT ADVANCES IN DERMATOLOGY IN CONNECTION WITH THE WAR.

MACLEOD of London deals with this subject in a recent article in the *Practitioner*.<sup>1</sup>

1. *Dermatitis from High Explosives*.—The dermatitis produced by these substances is of practically identical type, although the associated staining of the skin may be characteristic. *Tetryl* is a very strong chemical irritant, especially in the form of powder. It causes in those who work with it a yellow or apricot staining of the skin and of the hair. The dermatitis usually appears within a fortnight of beginning to work with the substance, varying from an erythema to edema and deep-seated vesiculation, associated with a very severe type of itching. A marked susceptibility is produced in those who have once been poisoned with it and is met with not only in the workers themselves but in people who handle soiled clothes which have been worn in the factory. The eyelids are very apt to be affected and there is often conjunctivitis and irritation of the mucous membrane of the upper respiratory tracts and of the stomach.

*Trinitrotoluene*. This is given off in the form of a fine dust in filling canisters and shells, which, coming in contact with the skin of the worker, gives rise to a severe type of dermatitis, and may by absorption result in toxic and even fatal symptoms. It may, like *tetryl*, be inhaled or swallowed with severe resulting effects. The eruption is often of a papulo-vesicular or bullous type, and is apt to become infected secondarily. There is also a yellowish staining, not so intense, however, as in the case of *tetryl*. The parts not covered with clothing are the most affected and it is often especially severe about the wrists and neck. There are often serious general effects, in the form of toxic gastritis, toxic jaundice, and toxic anemia. Idiosyncrasy seems to be especially marked in this form, as some skins are completely immune to it, while with others it appears at once and recurs on the slightest exposure. It is most common in hot weather, and in oily skins.

*Erythema*. In this the irritating effect is due

to the picric acid that it contains, which stains the skin a yellowish or greenish color. Several cases came under the observation of the writer and others in London in June, 1917, as the result of handling a powder from high explosive bombs dropped in the raids. In all of the cases a staining of the skin occurred at the time of contact with the substance, while the dermatitis did not appear for about ten days. In many of the cases the dermatitis was of a very severe type, preventing sleep, and occurring on the face, hands, and fingers especially. It healed rapidly, however, under soothing local treatment.

2. *Skin Affections Met with in the Army in France*.—Reference is made to MacCormac's paper at the Royal Society of Medicine in 1917, which has already been noticed in this JOURNAL. All emphasize the frequency of scabies and pediculosis as well as seborrhea and secondary infection.

3. *The Open Method of Treating Burns*.—The number of cases of burns has been very large owing to the added agencies of liquid fire, petrol, etc., and in connection with aeroplane accidents. MacLeod thinks the "open method" is in some respects preferable to the paraffine treatment, the principle being that of allowing healing to take place under a natural crust. It is particularly applicable to burns of the leg and face, and to the granulating surfaces which occur after the separation of the eschar. There are no dressings used, but the raw surface is exposed to the air and simply powdered with a bland aseptic powder, which cakes up with the discharge to form a crust under which healing takes place. As a powder, sterilized stearate of zinc, or magnesium carbonate may be used. To make the powder adherent, 10% of paraffin may be added. This powder is added from time to time by a dredger or insufflator until a thick, coarse, uneven crust is formed. The crust once formed is left alone, and allowed to dry up and separate spontaneously. A slight disadvantage of this method is that there may be an offensive odor which may be neutralized by the addition of an essential oil to the powder or by having a deodorizing mixture in proximity. The method does away with the need of periodical dressings and leaves the wound at rest, so that the new growth of epidermis is not interfered with frequently, as is ordinarily the case. Also the pressure

of the crust restrains the formation of exuberant granulations, and conduces to a supple scar. This treatment is of greatest value when all dead tissue has sloughed away and there is a raw, granulating surface, although it is applicable in the second degree burns and in the early stages of those of the third degree before the eschar has become separated.

#### SKIN LESIONS PRODUCED BY MUSTARD GAS.

Warthin and Weller<sup>2</sup> of Ann Arbor have conducted a series of investigations of the gross and microscopical pathology of the cutaneous lesions produced in man and animals by the direct application of this substance in its liquid form.

Of all the forms of gas employed in the war the most important one has been mustard gas (dichlorethylsulphide). This substance was first made by Victor Meyer in 1886 and described in the report of the German Clinical Association. It was first used on a large scale at Ypres in July, 1917. The symptoms of mustard gassing are described in the British Army reports as an initial tendency to sneeze, without irritation of eyes or lachrymation, with a gradually increasing nose and throat irritation, followed after about twelve hours by a free discharge of mucus from the nostrils, painful irritation and inflammation of the eyes, and occasionally vomiting. Many men had pain in the forehead and stomach. Small blisters may form on the face and neck; the skin of the thighs is occasionally red, sore, and sometimes blistered. Contact with fragments of shell and with the earth near shell holes may cause blistering through the clothes. None of these lesions manifests itself at once; it develops after several hours. The pain in the eyes may diminish after 24 hours, although acute inflammation may persist several days. In severe cases bronchitis and pneumonia may develop after 36-48 hours. There are usually no deaths under 24 hours. Prolonged exposure to small concentrations of the gas causes laryngitis and loss of voice, sufficient to put men out of action. Of the men affected, practically all have conjunctivitis, about 95 per cent. have throat and lungs affected, and about 70 per cent. show skin burns. After six weeks the skin lesions are usually healed. The eye, pulmonary, and cardiac conditions improve more slowly.

The results of the writer's experiments are as follows:

1. Dichlorethylsulphide (mustard gas) is an escharotic, specific in its action upon the epidermis and tissues of the corium, particularly upon the endothelium of the vessels.

2. The lesion is a chemical burn unlike that produced by heat, electricity, or the ordinary corrosives such as sulphuric, nitric, or hydrochloric acids, or strong alkalis. Of all these agents the effects are most closely allied to those of hydrochloric acid, but are much greater in intensity. It differs from a heat burn in the absence of thrombosis, in the greater degree of fluid exudation, in the greater moistness of the affected area, and in the fact that the necrosis as shown by the loss of nuclei requires hours or even days, for its complete development. The coagulated, shrunken, and cooked appearance of the tissue in heat burns is not apparent in the tissues of mustard gas burns.

3. The vessels in the affected area are severely damaged and collapsed and there is a local anemia in the earlier stages, with a marked fluid exudation and leucocyte migration. The process is non-hemorrhagic and non-thrombosing.

4. In man the necrosis of the epidermis is usually evident in two hours, through the hydropic change in the epithelium and early vesicle formation. There is no deep edema. It is confined to the epidermis and to the papillary layer in the early stages.

5. In animals the intense and deep edema is most striking and altogether different from that seen in man. Vesicle formation was not noted by us in animals.

6. The deep penetration of the smallest quantities applied to the surface is a most striking feature. There is an undoubted entrance through the hair follicles, sebaceous, and sweat glands.

7. The slowly progressive character of the necrosis is a specific characteristic, the height of the necrosis being reached five to ten days after application. This may, in part, be explained by contraction and death of the vessels with resulting anemia in the affected area.

8. The painlessness of the lesion is also a marked characteristic. This may be explained by the edema and degeneration of the nerve endings in the affected portion.

9. In none of our animals was there any conjunctivitis or irritation of the respiratory tract produced by the cutaneous applications.

We believe that the conjunctival and respiratory lesions are due alone to the direct action of the mustard gas and where animals are protected from the vapor no lesions in these organs will result, no matter how severe the skin burn.

10. Contrary to the statements of certain English and French observers, the admixture of water does not increase the escharotic action, but if the oil is immediately washed away, the lesion is greatly reduced in intensity. Washing within two minutes with tincture of green soap may entirely prevent the lesion, or there may result only a slight hyperemia.

11. The lesions observed in the axilla, between the fingers and toes, around the genitals and between the thighs of men gassed in action are probably due to the greater moisture of these parts from perspiration, and the resultant re-resolution of the gas.

12. The slow healing is probably due chiefly to the vessel injury and the relatively slight leucocytic demarcating infiltration. In this respect the lesion is strikingly like an x-ray burn of the skin.

#### BROcq's VIEWS ON ECZEMA.<sup>2</sup>

Eighteen years ago Brocq published his first study of the question of eczema, and since that time there has been relative silence on this subject which excited so much controversy from 1886 to 1900. It may be said that nothing of great importance has appeared that concerned these pathological forms, with the exception of some publications upon microbial dermatoses of eczematous appearance. Believing, in 1900, in the existence of a distinct morbid entity called eczema following to a considerable extent the views of the great masters of the French school, Brocq experienced, in 1904, a change of view. He considered it to have been shown that a number of common dermatoses, such as urticaria, various forms of pruritus, the eczemas, and psoriasis, could not, at least at the moment, be regarded as sharply defined diseases, but rather as "syndromes," *e.g.*, as combinations of several morbid cutaneous reactions, which are grouped and combined in different ways, and have a general evolution of a sufficiently special character, so that they present the appearance of a distinct disease. In 1911, Brocq, in collaboration with others, maintained that all the subjects of a papulo-vesicular eczema exhibited a certain amount of renal insufficiency,

and in nine cases out of 10 gastro-intestinal fermentations. Yet a careful analysis shows that these troubles exist most frequently in people who do not exhibit a papulo-vesicular eczema, and that other factors as yet ill-understood, which we are still forced to characterize as morbid predisposition, are necessary to produce the eruption.

Brocq has maintained since 1900 that the name of eczema pure and simple should be reserved for a dermatosis whose elementary lesion is a vesicle of special character, formed in the deep layers of the malpighian layer by an intercellular edema. It is characterized clinically by its small size, and extreme irregularity of disposition upon the affected surface. To demonstrate this lesion in the inflamed and oozing forms, the affected portion of the skin should be dried with a soft cloth, and immediately afterward the surface covered with a leaf of cigarette paper, upon which a glass compressor is applied, and the appearance observed through this compressor. In the case of the so-called dry type of eczema a very light ennetting may be necessary before applying the paper. In this way one may observe on the leaf of paper the vesicles that pepper the affected surface. If these vesicles are carefully studied they will be found to have an individual aspect and are not to be confounded with the vesicles of true dyshidrosis or with those of artificial eruptions of external origin.

The elementary lesion of papulo-vesicular eczema is a small red papule, situated often on a reddish urticarial base, the size of a small to medium pin's head, having at its apex a central vesicle, which breaks either spontaneously or from scratching, emitting a yellowish serum similar to that of true eczema, and more or less abundant, according to type.

These elementary lesions may be discrete and scattered without order over the surface, or they may be aggregated in places to form one or more patches, the so-called *nummular* forms.

Brocq considers the so-called *seborrheic* eczemas a form intermediate between eczema and psoriasis and has given them the name *parakeratoses psoriasiformes*. He distinguishes two forms, one a dry and scaling variety, in appearance much like psoriasis; the other presenting a surface exhibiting vesicles, like a true eczema. The characteristic elementary lesion of these dermatoses is a reddish macule, covered with

scales less compact than those of true psoriasis, which shows peculiar attributes when scratched or eured. When the lesion is very dry in appearance the cruetting is followed either by a slight purpura or a few fine points of serous oozing, and these appearances are produced before a thin pellicle is reached, unlike what we are accustomed to observe in psoriasis. In other cases, more or less numerous and prominent vesicles are formed on the red and scaling surface. These different forms exhibit, according to Brocq, intermediate links between pure vesicular eczema and psoriasis. In some cases of seborrheic eczema, the early lesion may be a small bulla, or small papulo-vesicle, or pustule,—but the characteristic elementary lesion is the red and scaling macule. In many cases there is a secondary pustulation from complication with pyogenic cocci. Hence the importance of recognizing this infection and instituting appropriate local medication before treating the underlying primitive dermatosis.

Brocq insists upon the pathogenic and etiological complexity of eczema, and upon the consequent fallacy of attempting to draw sharp lines of distinction. Yet an objective analysis of the cutaneous lesions will give much useful information. In true vesicular eczema it seems to be chiefly external agencies that are active: traumatism, contact with irritating bodies, perhaps micro-organisms—in any case direct action on the integuments of substances whose contact is no longer tolerated by the skin of which the power of resistance seems to be diminished. The artificial vesicular eruptions of external causation are not to be confounded with true eczema, but it is certain that in subjects predisposed to eczema, irritating external agencies (including wind, sun, dust, etc.) aid greatly the production of a pure vesicular eczema. In the papulo-vesicular form, the dominant etiological factors seem to be accidental and auto-intoxications, and shocks of the nervous system. In almost all the subjects of this form of eruption there are gastro-intestinal fermentations and a certain degree of renal insufficiency. In the “parakeratoses psoriasiformes,” the predominating pathological fault seems to be troubles of general nutrition and in particular an excess of nitrogenous food. When the pruritus is so violent that the cutaneous lesions take on a lichenoid type, there is present an intense nervous excitation, which is accentu-

ated by errors of diet (the excessive use of tea, coffee, or chocolate) or by over-exertion, or great moral or physical shock. The writer repeats his reservation that these propositions are not absolute, and that in the causation and treatment of eczematous eruptions only broad principles can be laid down. But if, in the course of an eruption of the type of pure vesicular eczema, there appear outbreaks of papulo-vesicular character, one should inspect the condition of the kidneys and of the digestive tract; if a lichenoid condition is produced, the condition of the nervous system should be inquired into; if a seborrheic condition is apparent, it should be seen if the diet is most suited to the patient, and does not contain too large a portion of proteids, etc.

These broad principles will serve as a guide in a very general way to the treatment both internal and external. When there is present a very acute eruption with great cutaneous irritation, local medication by means of drying powders should be resorted to, as a rule, in a large majority of the cases, whatever may have been the original form of the eruption, or else emollient ointments, or moist emollient applications, together with internal medication are indicated.

When these acute inflammatory symptoms have abated, then each type of eruption calls for its distinctive treatment. A true oozing, vesicular eczema may be especially modified by erude coal tar, the papulo-vesicular type by coal tar varnishes, or by zinc pastes with the addition of a 20th to a 50th of coal tar; the “parakeratoses psoriasiformes” are amenable to ichthyol, thigenol, tuminol, coal tar; and in their moist forms to pastes containing both coal tar and vegetable tar.

#### MULTIPLE SKIN METASTASES FROM CANCER OF INTERNAL ORGANS.

Suzuki,<sup>4</sup> working in the Kyoto Imperial University Medical School, in Japan, reports five cases of this affection which had come under his personal observation, and gives his analysis of 110 cases, collected from the literature. Metastases in the skin are so rare in cancer of the internal organs that writers have recorded many thousand cases without occurrence of these secondary tumors. Of the author's five personal cases, four were in males, four men between 40 and 50 years of age, and one be-

tween 60 and 70. There was an autopsy in four of the cases, which revealed a primary cancer of the stomach in three cases, and of the rectum in one case. The remaining case was, perhaps, cancer of the stomach. As to localization of the skin metastases, the thorax and abdomen were found to be the parts most frequently implicated; in four cases the metastases were tuberculous and localized mostly in the subcutaneous tissue, while in one case there were diffuse flat infiltrations in the corium and subcutaneous connective tissue. Four cases were adeno-carcinoma, and one scirrhus. The metastasis seemed to be in some cases hematogenous, in others lymphogenous. In three of the cases the patients died within about four to six weeks from the time of the first appearance of the skin metastasis, in the two other cases the time was not known.

From the statistical study of 110 cases, the writer found that in Japan there was a great preponderance of male over female cases, the reverse of what is found in other countries. This result accords with the statistics of cancer in general, which is much more common in males than in females in Japan, while the female sex in all other countries gives the greater number of cases. From 30 to 40 is the age most frequently affected. In more than one-half of the cases the primary tumors are located in the digestive organs, and most frequently in the stomach. Next come the uterus, lungs, and ovaries. As to localization it may be said that skin metastases develop mostly in the cutis and subcutis simultaneously, or in the subcutis only. These skin metastases are mostly in the nodular forms, while diffuse infiltration is very rare. The nodules vary from the size of a pea to that of a walnut, as a rule, miliary lesions being very rare. In some cases the infiltrated areas are very large, spreading over a large part of the thorax or abdomen, which seem to be the favorite seats of the skin metastases. The abdomen and chest are more frequently affected than the dorsal and lumbar regions. It is more common on the extensor than on the flexor side of the limbs. When the skin metastases occur the prognosis is naturally bad, and investigations concerning the duration of life from the appearance of the skin tumors to the death of the patients show that they mostly die within three months.

#### DERMATITIS FROM THE TOMATO PLANT.<sup>3</sup>

The list of plants that may produce a dermatitis in susceptible subjects is constantly being added to. The most comprehensive treatise on this subject is that published by James C. White in 1887 under the title "Dermatitis Venenata," an account of the action of the external irritants upon the skin. Since that was published, Dr. White himself has added considerably to his list of poisonous plants and notices of new observations have been appearing from time to time. Lain of Oklahoma City read a short paper at the meeting of the Section on Dermatology of the 69th annual session of the American Medical Association in Chicago, in June, 1918, on this subject. The writer states that his residence in the South, where the vegetation is prolific, has given him the opportunity to study and observe the effects of various plants and vines upon the skin. For the last few years he has met with a form of dermatitis on the face and hands of gardeners and dealers in vegetables that it has been very difficult to account for. Finally he was led to the discovery that the ordinary tomato plant, which is common in most gardens in the season, seemed to be connected with this form of dermatitis, and that it appeared in several cases after gathering this vegetable from rank and moist vines. The botanical name of the tomato plant is *Lycopersicon esculentum*. It was for years considered unsuitable for food and was not generally cultivated for this purpose until the middle of the 19th century. It belongs to the family of night shades and to the Solanaceae group. Nearly all of this group is said to contain poisonous narcotic alkaloids or glucosides, which may be converted into a certain amount of hydrocyanic acid. The eruption that has been traced to the tomato plant does not differ, apparently, from the ordinary type of dermatitis venenata. The eruptions seen have occurred chiefly on the dorsum of the hands, the wrists, and both surfaces of the forearms, and are of a papular and small vesicular character. The poisonous effect seemed to be produced generally by exposure of the hands and forearms among the vines when the plants were wet with dew in the early morning and this moist condition seems to be a favoring element in the case of other infectious plants. The writer thinks it improbable that the same plant is equally infectious in

all places, or at all seasons of the year, and confesses that his conclusions are drawn from a small number of observations, and that it is strange that others should not have met with this condition before.

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- <sup>1</sup>Practitioner: February, 1919.  
<sup>2</sup>The Journal of Laboratory and Clinical Medicine: May, 1918.  
<sup>3</sup>Annales de Derm. et de Syph.: December, 1918.  
<sup>4</sup>The Journal of Cancer Research: October, 1918.  
<sup>5</sup>Journal American Medical Association: Oct. 5, 1918.

## Book Reviews.

*The Elementary Nervous System.* By G. H. Parker, Sc. D., Philadelphia and London: J. B. Lippincott Company. 1919.

In the lower multicellular animals are represented the simplest structural and functional examples of the elementary nervous system. This monograph on experimental biology, "The Elementary Nervous System," attempts to interpret through the activities of the simpler animals the more complex forms of higher animal forms. Three simple phyla of the multicellular animals, the sponges, the coelenterates, and the ctenophores, are the basis of observations presented in this volume. The book is divided into three sections: the first dealing with effector systems, illustrated by sponges, with a consideration of independent effectors and neuroid transmission in higher animals; the second, describing receptor-effector systems and explaining the neuromuscular structure of sea-anemones and their nervous transmission, the nerve net, and hydroids; and the third section outlining briefly the relations between the elementary nervous system and the central nervous system of the more complex animals. The subject has been approached generally from the anatomical and histological standpoints; in this volume, the chief emphasis is on the functional, rather than the structural aspects, and should further the development of experimental biology.

*Mechanisms of Character Formation.* By WILLIAM A. WHITE, M.D. 12 mo. pp. 342. The Macmillan Co., New York, 1916. Price, \$1.75.

The sub-title of this book, "An Introduction to Psycho-analysis," indicates sufficiently that this is one of the books devoted to some of the wider aspects of the theories which are commonly called Freudian. Dr. White's writings are always interesting, and clearly written, and in this book he has drawn upon a large amount of material from myths, folk-lore, and beliefs of primitive peoples to support the theories which he propounds. He sets forth in a way that is very convincing the conflicts of emotions and desires and the effects of the limiting in-

fluences of social environment, education and other things upon the psyche or character.

The handling of the Freudian incest impulse in the chapter on the "Family Romance" in its broader aspects as the attraction to the home that keeps one infantile is illustrated with a wealth of examples from many sources, including various forms of mental disease, so that new points of view are shown the reader, though the reviewer cannot follow the author in accepting this as always an incest impulse, or even sexual. Neither does Dr. White bring any convincing arguments for the acceptance of Freud's fantastic censor of thought, nor for the arguments that the conflicts between the pleasure-pain and reality motives date back to the placid intrauterine existence of the individual, both of which doctrines seem so vital for the acceptance of the Freudian psychology. Nor are the portions of the book upon symbolism, transference, transposition upward or other peculiar theories at all convincing.

*Surgical Treatment.* A Practical Treatise on the Therapy of Surgical Diseases for the Use of Practitioners and Students of Surgery. By JAMES PETER WARBASE, M. D., Fellow of the American College of Surgeons, American Medical Association, American Academy of Medicine, New York Academy of Medicine, Surgeon to the Wyckoff Heights Hospital, Brooklyn, N. Y.; formerly Attending Surgeon to the Methodist Episcopal Hospital, Brooklyn, N. Y., in three volumes, with 2400 illustrations. Volume II. Philadelphia and London: W. B. Saunders Company. 1918.

The second of the three volumes of "Surgical Treatment" (Warbase) is somewhat smaller than the first: it contains about 800 pages of text, and 750 illustrations: it covers injuries and diseases of the head, neck, chest, and abdomen, including the special subject of eye, ear, and nose.

The good impression made by the first volume is continued by the second.

The eye, ear, and nose, usually omitted from general surgical text books, are treated in detail and at great length; the procedures both of general and special surgery are briefly described, all unnecessary details being omitted. Illustrations supplement the text in exceptionally good fashion, the pictures of operations on the intestines being unusually good, and very numerous; we regret not to find among them Monks' excellent cuts on intestinal localization.

The section of the spleen seems proportionately too short, only four pages out of 290 devoted to the abdomen.

Taken as a whole, this second volume is admirable; it is recommended cordially to the profession.

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## RED CROSS LEAGUE SOCIETIES.

It has been announced by the National Red Cross Headquarters that there has been formed in Paris a League of Red Cross Societies for the purpose of unifying the Red Cross organizations of the world in a systematic effort to anticipate, diminish, and relieve misery produced by disease and disaster. The American Red Cross has stated that the objects of the League are:

1. To encourage and promote in every country a duly authorized voluntary National Red Cross organization, having as purposes the improvement of health, prevention of disease, and mitigation of suffering throughout the world, and to secure the coöperation of such organizations for these purposes.

2. To promote the welfare of mankind by furnishing a medium for bringing within reach of all peoples the benefits to be derived from present known facts, and new contributions to

science, and medical knowledge and their application.

3. To furnish a medium for coördinating relief work in case of great national or international disasters.

The control of the League will be by general council, composed of representatives of all members of Red Cross societies meeting at designated periods. A governing board of fifteen members will be chosen by the general council to direct the affairs of the League in the intervals between such meetings. Henry P. Davison of New York, formerly chairman of the War Council of the American Red Cross, is chairman of the League's first Board of Governors. Other members of the board chosen thus far are: Sir Arthur Stanley of the British Red Cross, Comte Kergorlay of the French Red Cross, Count Frascara of the Italian Red Cross, and Professor Ninagawa of the Japanese Red Cross. Geneva will be the headquarters of the League, and the world health program shaped at Cannes will be further prepared.

While it is expected that the League of the Red Cross will establish intimate relations with the League of Nations, it should be understood that the Red Cross League, being a purely voluntary, non-political, non-sectarian, non-governmental organization, has no statutory connection with the League of Nations or with any government.

Mr. Davis, commenting on the Red Cross League, said: "The Red Cross Societies of the United States; Great Britain, France, Italy, and Japan have, for several months, worked incessantly through their representatives, to devise an agency which would adequately cope with the world problems of disease and disaster. We hope it will be universal in membership. From the outset it was clear to us all that there was no institution in the world so well adapted to this task as the Red Cross, because of the peculiar hold which it has upon the hearts of all peoples, irrespective of difference of race and religion; because of the amazing development of its powers in the recent war, because of the anxiety of its membership not to lose the opportunity for service when war service was no longer needed. It is generally believed that the health problems of the world can never be solved by doctors alone, but must enlist hearty volunteer coöperation of the peo-



ples themselves; and no organization can mobilize the peoples of divergent views as can the Red Cross. For this reason the five largest Red Cross societies have united to bring about universal Red Cross coöperation.

#### TYPES OF NEUROLOGICAL CASES.

WE have received recently three articles by Dr. John Jenks Thomas, one of which, "Neurological Indications for and against Operation in Traumatic Injuries Affecting the Central Nervous System," was published in our issue of the JOURNAL for October 11, 1917. In this article, Dr. Thomas presents the subject of surgical treatment of injuries of the brain and spinal cord, considering first, the cases of injury of the spinal column. The spinal cord, and in addition, the cauda or nerve roots, may be injured in various ways where there is trauma applied to the spinal column. In some cases, there results a compression fracture of the body of one or more vertebrae. There are frequently instances in which the area of destruction in the cord is found to be unilateral, and there is present the Brown-Séquard syndrome of loss of superficial sensation in the opposite side of the body from the lesion, with loss of motion and deep sensation on the same side. The author cites histories of these cases, and considers the value of surgical operation in cases of dislocation of the spine, total crush of the spinal cord, and fractures of the skull.

In a second article, Dr. Thomas considers three cases of chronic progressive lenticular degeneration with mental deterioration. He quotes from Wilson the clinical features of this condition, and enumerates as symptoms involuntary movements, which he describes as a tremor nearly always bilateral, and affecting both upper and lower extremities, usually rhythmic, occasionally irregular, increasing with volitional movements of the limbs. There is pronounced spasticity of the limbs and face, and in the later stages, contractions develop and there is dysphagia, dysarthria, and eventually anarthria. Pathologically, there is found a bilateral, symmetrical softening of the lenticular nucleus. Dr. Thomas cites the cases of three children in one family, similarly affected,

with no discoverable heredity. The author reports that these cases differ in several essential points from those observed by Wilson, first in the character of the tremor, the absence of fixed spastic smile, the dysphagia, and especially in the evidence of the affection of the pyramidal tracts. There was no evidence of any affection of the liver. These cases show a close resemblance to those described under the title of pseudo-sclerosis. Dr. Thomas believes that the difference between these three cases and those described by Wilson justify him in considering them due to a process more degenerative in character than destructive, and probably not as sharply limited to the lenticular nucleus as the changes found in Wilson's disease.

Dr. Thomas' third article is, perhaps, the most interesting, because it is a product of the war and describes types of neurological cases seen at a Base Hospital. Dr. Thomas was in charge of the medical division of the English Base Hospital in France, which was given over to the care of the first unit sent by Harvard University. He also had opportunities of hearing of work in other hospitals. In the cases which came under his observation, gunshot wounds of the head, back, and arms were quite frequent. In regard to injuries of the large nerve trunks in the extremities, in a large number of instances the nerve was found not to have been divided, but merely contused by the missile, or rarely compressed by hemorrhage within or about the nerve trunk, or by edema of the surrounding soft parts. The author learned that at English hospitals a method had been found for testing the nerve function by means of electrical currents passing through condensers, thus making it possible to determine accurately, after a period of about three weeks from the date of the injury, the extent of damage to the nerve and whether or not it had been divided. Dr. Thomas has expressed his belief that operations on nerve trunks are better postponed until the wound has healed, and mentions various measures, both operative and non-operative, to be considered after the completion of healing.

Dr. Thomas divides injuries of the spinal cord into two general classes: first, those in which a cord has been injured directly by the missile or by fragments of the spine driven into it which lacerate it or compress it; and

second, cases in which there is a softening of the cord or hemorrhages into its substance, produced indirectly by the concussive effects of the projectile. The author cites instances of cases to illustrate injuries to the spine and wounds of the brain, and explains methods of treatment. In the latter cases, he believes that early operation offers no advantages to compensate for the disadvantages of limited appliances at the hospitals near the firing line.

These articles by Dr. Thomas are valuable contributions to medical literature.

### “PTOMAIN POISONING.”

It is a regrettable fact, yet none the less true, that in most cases when we are uncertain concerning a diagnosis we fall back on “blanket” terms such as “autointoxication,” “septicaemia,” “disturbances of the automatic nervous system,” and “ptomain poisoning.” Alvarez<sup>1</sup> aptly points out that “fashions in this ‘cloak of ignorance’ change just as they do in wearing apparel.” Further study of such diagnoses usually shows that many specific etiologic factors have been wrongly incorporated under one term. Particularly does this seem to be true in the case of “ptomain poisoning,” as pointed out in a recent article by Dr. M. J. Rosenau.<sup>2</sup>

This author is firmly convinced that the diagnosis “ptomain poisoning” is never justified, that it lacks precision, and that it is synonymous with uncertainty. It is pointed out that the word “ptomain” was first used in 1873 by Selmi to designate certain products of putrefaction which, at that time, were included among the animal alkaloids; that since 1873 many attempts have been made to identify “ptomains,” the most recent definition being suggested by Vaughan, who described them as intermediate cleavage products of protein decomposition.

Split products of protein putrefaction are comparatively easy to isolate, and some of them, when injected parenterally, have been shown to be poisonous, but, so far, none of them have been demonstrated to be harmful when taken by the mouth. These products are usually isolated from food which is in a state of putrefaction far past the edible stage and in addi-

tion, it should also be noted that chemists are rarely sure of their purity even when obtained in the crystalline form. Most of them are amines and are not poisonous at all, or at least no more so than their corresponding ammonio salts. For these reasons the chemical search for protein fractions as the cause of food poisoning has been almost abandoned.

Many outbreaks reported as “ptomain poisoning” have been investigated in the Department of Preventive Medicine and Hygiene of the Harvard Medical School. In only a small residue of their cases have they found it impossible to demonstrate a definite etiologic factor, and in these cases the symptoms were very mild and transient. Among the ailments which were diagnosed “ptomain poisoning” may be mentioned bacillary dysentery, oxalic acid poisoning, over dosage of potassium nitrate, food idiosyncrasies or anaphylactic reactions, heat exhaustion, food indiscretions, tartar emetic poisoning, uremia apparently due to neoplasm, nervous diarrhea, botulism, and various bacterial infections.

From these observations it must be perfectly clear that not only is the term “ptomain poisoning” vague and indefinite, but, in addition, an actual misnomer. As suggested in the article quoted above,<sup>2</sup> it would seem to be a great step forward if the profession would discontinue the use of the term and let the diagnosis stand as “gastro-enteritis of unknown origin,” much as the British use the term “Pyrexia of Unknown Origin” (P. U. O) for fevers, the cause of which is undetermined.

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<sup>1</sup> Alvarez: Jour. A. M. A., Jan. 4, 1919.

<sup>2</sup> Rosenau: Medical Clinics of North America, March, 1919, p. 1511.

### TYPHUS IN CENTRAL EUROPE.

An appeal addressed to the international committee of the Red Cross by the president of the Austrian Red Cross, published in a recent Public Health Report, discloses the seriousness of the typhus situation in central Europe. The disease has spread through all the districts of Poland, in the country of the Jugo-Slavs, especially in Old Serbia, and is spreading rapidly toward the west. Contamination is spread by the repatriated soldiers who, without food,

clothes, and sanitary conditions generally, are easy subjects for infection. In response to the call for assistance from all sides, especially Poland and Ukraine, the Austrian Red Cross assembled the sanitary delegates of Poland, the Ukraine, of Jugo-Slavia, and of German Austria for a conference which took place on February 28. It was voted to appeal through the Austrian Red Cross to the International Committee of the Red Cross in Geneva, and ask that an international commission be appointed by the allied states to contend with the typhus situation.

The appeal points out that in order to check the plague, sanitary help should be given to the suffering countries at once. Modern hospitals and disinfection stations should be erected, and mobile sanitary formations, disinfection units, and field laboratories equipped. Prophylactic measures should be taken at all points of entrance on the western border, and repatriated soldiers should be provided with linen, clothes, food, medicines, and disinfectants. The disease is extremely infectious, and is transmitted by the clothes louse; centers of infection are easily formed in distant localities, thus exposing many to contagion. This report of conditions in central Europe shows that the danger from typhus threatens the whole of Europe, and should receive special attention.

In recognition of this situation, it has been announced in a recent issue of *The Red Cross Bulletin*, that the League of Red Cross Societies has recently addressed an appeal to the Red Cross Societies of Great Britain, France, Italy, Japan, and the United States, and to the twenty-four national societies which have been invited to join the League, asking them to prepare to participate in a campaign against the spread of typhus. The Supreme Economic Council, representing the allied governments, will place at the disposal of the League surplus medical and hospital supplies belonging to the British and American armies and will insure transportation. The League will supply and maintain personnel for the administration of this work. A definite plan will be prepared by a committee for submission to the various governments. This united effort to check the typhus epidemic is an indication of the future usefulness of the League of Red Cross Societies.

## MEDICAL NOTES.

### BOSTON AND MASSACHUSETTS.

WEEK'S DEATH RATE IN BOSTON.—During the week ending June 28, the number of deaths reported was 181 against 207 last year, with a rate of 11.85 against 13.77 last year. There were 32 deaths under one year of age against 27 last year.

The number of cases of principal reportable diseases were: Diphtheria, 51; scarlet fever, 35; measles, 28; whooping cough, 34; typhoid fever, 1; tuberculosis, 52.

Included in the above were the following cases of non-residents: Diphtheria, 7; scarlet fever, 1; tuberculosis, 3.

Total deaths from these diseases were: Diphtheria, 2; measles, 2; tuberculosis, 20.

Included in the above were the following non-residents: Diphtheria, 1; tuberculosis, 2. Influenza cases, 1; influenza deaths, 0.

ITALIAN MEDICAL SOCIETY OF BOSTON.—The Italian Medical Society of Boston held a banquet at the Hotel Napoli in Boston on June 23, 1919, in honor of the president, Dr. Rocco Brindisi, who will sail for Italy within a short time. Dr. Edward O. Otis and Dr. Lincoln Davis described their experiences in Italy. The following officers were elected for the ensuing year: President, Dr. Antonio De Robertis; vice-president, Dr. Gerardo M. Balboni; secretary, Dr. Gaetano Praino; treasurer, Dr. L. Ciuni. Dr. Rocco Brindisi was elected honorary president.

## Obituaries.

### FREDERICK WALLACE ABBOTT, M.D.

DR. FREDERICK WALLACE ABBOTT died at his home in Taunton on June 19, in his fifty-ninth year. Dr. Abbott was born at Dover, New Hampshire; he was educated in the public schools of Dover, Berwick, and South Berwick, Maine, and after teaching for four years, entered Dartmouth College. He received the degree of A.B. from the University of America in 1883, attended the medical department of Bowdoin College for two years, and was graduated from the Eclectic Medical College of Maine in 1886. In the same year Dr. Abbott married Sylvia Apphia Emery, of Kennebunk.

Dr. Abbott practised in Taunton until the latter part of his life, when he devoted considerable time to consulting and medico-legal work and diseases of the nervous system. He was honored by two professorships: the Professorship of Eugenics at the Eclectic Medical University of Kansas City, Missouri, and a Professorship in Middlesex College. Dr. Abbott had been elected head of the Eclectic Association, and had received among many honorary degrees, an A.M. from Taylor University; a Ph.D. degree from the National Normal University (Lebanon University since 1908); he was an LL.D. of Potomac University in 1905, of which institution he was also one of the guiding officers; he was F.S.Sc. (1901) of London in 1908. Dr. Abbott was licensed to practise in Michigan in 1890, and in Vermont in 1897, and was also lecturer on physiology and hygiene at Merrimac County Academy, Concord, N. H. He also was an honorary life member of the Société Internationale de Philologie, Sciences et Beaux Arts, England, with the title of F.S.P., and an active member of the American Association of Official Surgeons.

Dr. Abbott contributed many articles on medical and surgical subjects.

#### SARAH ADAMS BOND FRASIER, M.D.

DR. SARAH ADAMS BOND FRASIER died at her home in Jamaica Plain, June 28, 1919, after a long illness following pneumonia, which she contracted while working for the War Department in Virginia. She was born in Boston August 13, 1858, the daughter of the late Thomas and Mary Bond. She attended the preparatory school of the Massachusetts Institute of Technology and then went on to the Woman's Medical College of Pennsylvania at Philadelphia, where she took an M.D. in 1891. Returning to her native city, she settled in practice, became a physician to the New England Hospital for Women and Children, and joined the Massachusetts Medical Society. She was president of the New England Women's Medical Society. At the time of her death she was medical examiner to Radcliffe College and consulting physician to the New England Hospital for Women and Children.

A week before her death Dr. Bond married Frederick W. Frasier, a retired business man.

### Miscellany.

#### ENCEPHALITIS: ACUTE, EPIDEMIC, LETHARGIC. A SELECTED BIBLIOGRAPHY.

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that the science of nutrition, which they are attempting to apply in daily life, has heretofore been founded almost entirely on studies of the energy aspects of the problem with very little consideration of the chemical side of the question, which is only just beginning to assume its due importance. Only a moment's thought shows that nutrition is a chemical process and that the energy relations of this are only incidental to the chemical. The energy features of nutrition have been studied with great care and measured with great accuracy and, so far as these investigations have gone, must be accepted as established on an absolutely firm foundation; but those who have devoted their lives to such investigations have unanimously admitted to me that much remains to be learned before we can tell a man "how much to eat." I agree that we can tell an individual *some* of "his dietary needs" and protect him from *some* of the dangers he may fall into in consequence of living under artificial conditions. This is possible with our present knowledge, but I maintain that it must be done with the exercise of common sense and with a full realization of the limitations of our present learning, if we are not to risk great dangers.

There is no question but that good and much needed advice can be given to people living under restricted conditions, especially when these are imposed by poverty. I am the last one in the world to wish to discourage aiding such unfortunates, but I do feel that common sense should guide our efforts. So many of those engaged in such work appear to assume that science has solved *all* the problems of nutrition that it seems to me time to call attention to the fact that much of the advice they give is hardly justified by our present state of knowledge.

Whether one is eating too much or too little is practically impossible to determine positively unless, as I pointed out, the scales demonstrate a steady gain or loss of weight. Even in such cases, obscure pathological conditions may determine the food intake so that less or more food than the appetite demands may lead to a condition worse than that earlier prevailing. I fully agree with Dr. Greeley when he says that the fat man seldom, if ever, establishes a normal condition from a reconstruction of diet alone. Many such men, I believe, will ultimately be recognized as suffering from perverted metabolism in which the food is stored as fat with abnormal ease while factors essential for normal metabolism are not produced. One such case, under my daily observation for many years, when his apparently excessive food supply is reduced, manifestly suffers as much as would a normal individual placed on a calorifically inadequate diet. We all recognize it diabetes a perversion of metabolism whereby carbohydrates escape utilization. It is not unreasonable to suppose that obesity may represent another form of perverted metabolism. Until more is known than the very little that has yet been learned about intermediary metabolism, we will not be in a position to dogmatically assert that one individual overeats or that another undereats.

How many and how complex are the conditions which determine how much one shall eat? It becomes practically impossible to determine for any individual what his food intake should be from day to day. If Dr. Greeley can furnish any better guide than the instinct of the average normal man under conditions permitting a free choice of diet, he ought to make it known to all the world. It is easy enough to establish statistically what is the average calory intake of large numbers of individuals living under similar conditions of activity and diet. As I pointed out in my article, this has already been done and has been made the foundation of the prevailing judgment respecting the food requirement of the average man. This, however, recognizes that the average man under normal conditions instinctively eats about as much as he needs, which was the main point of my contention. When the needs of single individuals are to be prescribed for, I can see no reason for discarding instinct as a guide, for if it is admitted to be trustworthy in fur-

## Correspondence.

### THE CHEMISTRY OF NUTRITION.

New Haven, Conn., May 24, 1919.

Mr. Editor:—

My attention has recently been called to comments (in this JOURNAL, Vol. clxxix, No. 25) by Dr. Hugh Payne Greeley on my paper published in the *Atlantic Monthly* for last September.

Among our practising physicians, teachers, and dietitians there are many who, like Dr. Greeley, appear to have not yet become familiar with the newer work in the chemistry of nutrition and the changed viewpoint entailed by it, and so have failed to appreciate its practical application. It seems to me to be of some importance to reply to Dr. Greeley's comments—not merely because he attributes to me certain opinions which are exactly contrary to those I really held, but more especially for the reason that the article to which he takes exception was written for the express purpose of calling these new and interesting aspects of the science of nutrition to the attention of those who might otherwise fail to appreciate their significance, and to stimulate discussion of the subject as well.

Some of those who are now teaching do not realize

nishing the statistics on which modern dietetics has been founded, it certainly ought to be helpful in guiding the majority of single individuals in satisfying their own requirements.

I am perfectly ready to admit that there are cases where instinct fails. Perverted instincts have long been recognized, but for the great majority I am convinced that food intake can be controlled by instinct far more accurately than it can ever be controlled by intellect. Too many factors, difficult to determine or to measure, are involved to make control by reason a workable proposition.

Dr. Greeley opens his review of my paper by quoting statements in regard to views generally held concerning overeating. These quotations would lead the reader of his article to believe that these were views which I endorsed, whereas the purpose of my paper in the *Atlantic Monthly* was to call these very views into question. Further, he quotes: "Waste of food from overeating is doubtless small and quite likely compensated for because a large proportion of the 'good feeders' are among the most efficient in every community." This he disposes of by the dogmatic statement that "The efficiency of these individuals shortens their lives in direct ratio to the number of pounds overweight they are." Quite likely this is in general true, but he missed the whole point of this part of my paper when he assumed that those whom I designated as "good feeders" were overweight. Something cannot be made out of nothing and little in the way of efficiency can be expected of an individual who does not metabolize efficiently.

Dr. Greeley next refers to my remarks on the capacity of millionaires to metabolize, in such a way as to lead me to suspect that he believes that the possession of wealth has an abnormal influence on the physiology of men. It doubtless does wreck the constitutions of some, but I believe that quite as many have been ruined by a fear of the disasters which might result from their unrestrained appetites. I have myself seen cases of millionaires who have been so frightened by the advice of their physicians and so enfeebled by the diets prescribed that the last days of their short lives have been spent in misery.

Dr. Greeley says that "when Professor Osborne says that dietary habits which satisfy the promptings of instinct are among the most difficult to change, whereas those that do not satisfy instinct are easily changed, he shows a better acquaintance with the dietary habits of the albino rat than with those of his fellow men;" and again, "Dietary habits are habits, and I have yet to see any dietary habits easy to break." From this I conclude that it has been Dr. Greeley's practice to attempt to make his patients change already adequate diets. Did he or anyone else ever hear of a man born in poverty and reared on a diet restricted by poverty, who, when he acquired wealth, found it difficult to change his dietary habits?

Dr. Greeley quotes me as saying that "It is not at all improbable that many delicate people of sedentary habits, who eat but little, suffer chiefly from a deficient supply of vitamins." This he says is a statement "which the practical clinician would feel inclined to dispute." Dr. Greeley's conclusion is undoubtedly correct, for very few clinicians have as yet had an opportunity to observe the almost miraculous effect of vitamins on animals that have been previously fed on foods deficient in this factor. I am convinced that this is a subject of very great practical importance, well worth the attention of clinicians.

Since it has been demonstrated beyond all question that death soon ensues when a vitamin-free diet is fed and that the need of vitamins is quantitative, there is every reason to believe that many persons who are run down and miserable, with poor appetites, and perhaps living on one-sided diets, are really chiefly suffering because their food intakes are so small that they fail to supply the requisite quantity of vitamins. Physicians frequently prescribe travel, diverting company, tonics, or other changes to improve the condition of such persons. Better appetites are

invariable concomitants of the improved physical condition which may follow such treatment, and with increased food intake an increased vitamin intake is inevitable. On this assumption, I have suggested to two or three people who were disinclined to eat a normal quantity of food that they should try increasing their vitamin intake by eating a few grams of dried yeast each day. In all these cases appetite was promptly increased with a marked improvement in well-being. Whether this was the result of the larger vitamin supply or a mere coincidence I do not know, but, at any rate, the experiment seems well worth trying on a larger scale by clinicians, especially as no ill effects can be expected except in cases where purines should be excluded from the diet.

The influence of vitamin on appetite is astonishing, the food intake after adding a little vitamin to a diet low in this factor often being increased from 100% to 200%. An animal which has declined on such a diet and is consuming too little food to maintain its body weight may usually be stimulated by a little yeast, fed separately and apart from its food, to eat enough of the diet on which it was previously declining to quickly regain its lost weight. When food intake, and consequently the vitamin intake, is thus established on a higher plane, the vitamin intake may then be sufficient to enable the animal to continue to gain weight on the same food after the supply of yeast is suspended.

Dr. Greeley concludes his criticism as follows: "Must we not teach the new American his particular dietary needs, both as to what and how much to eat?" To this I answer most emphatically, yes, but in return I ask how can we do so? If we attempt to tell the man who knows nothing of the principles of nutrition how he should regulate his food intake, it is absolutely necessary that those who teach should know what "the particular dietary needs actually are," and that is just what we do not as yet fully know.

Dr. Greeley apparently assumes that I object to the use of experience and science in feeding men or animals under restricted conditions; under conditions of free choice he agrees with me that men as well as animals living in a state of nature are guided successfully by instinct. It requires but a moment's thought to realize that this is also true in the civilized state under like conditions of free choice. If it were not so, mankind would have perished long ago, for only recently have they been guided in any other way.

Domestic animals and men in institutions must either eat the rations furnished or starve. Under such circumstances instinct has no chance to exercise choice and, of course, cannot be expected to be helpful. My observations lead me to think that many individuals who need no help to save themselves from the consequences of a diet imposed by the limitations of either their circumstances or their intellects, have often suffered more through following the advice they have received than from the unfortunate condition which their advisers were trying to relieve.

In my *Atlantic Monthly* article I endeavored to point out typical instances of the wise guidance of instinct, to the end that these might receive more attention than has recently been given them, and also to point out that there are still many problems which science must solve before we can really know as much about nutrition as some practitioners of medicine and many unreflecting or ill-informed teachers of so-called "domestic science" now assume to be fully proved. In other words, my article was in one way a plea for the exercise of a little common sense in attempting to apply in practice ideas and beliefs which are not proven and may or may not be true. Dr. Greeley and I are by no means as far apart as he seems to think, in our opinions as to what and how much we should eat.

THOMAS B. OSBORNE.

# The Boston Medical and Surgical Journal

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## The Massachusetts Medical Society.

### PAPERS AND DISCUSSIONS OF THE ANNUAL MEETING OF THE SOCIETY, JUNE 4, 1919.

#### WHAT GENERAL SURGERY HAS GAINED FROM THE WAR.

By HUGH CABOT, C.M.G., M.D., F.A.C.S., BOSTON.

*Lieutenant-Colonel, R.A.M.C.; Former Officer Commanding No. 22 General Hospital, B. E. F.*

THE contributions which the war will be found to have made to general surgery center almost entirely about the management of contaminated and infected wounds. Other departments of surgery, notably orthopedic surgery, involving the question of the late results of bone injuries, are likely to be importantly affected, largely through the opportunity of working out on a large scale methods of treatment which have heretofore remained somewhat in the realm of the doubtful on account of insufficient experience. Particularly is this true of the application of bone grafts and the treatment of ununited fractures.

My own experience though large in numbers was limited to the care of casualties in the comparatively early stages. None of the Brit-

ish hospitals in France were in a position to keep their patients any longer than was absolutely necessary and it followed that our knowledge of end results where these were long postponed was of necessity much limited. On the other hand, a very large opportunity was given for the study of wounds at periods varying from 24 hours to several days after the occurrence of the casualty, and it is therefore possible to survey the field of acute war surgery with some prospect of accuracy of conclusion.

The great problem of this war was the management of contaminated and potentially infected wounds. The distinction between contaminated and infected is a real one upon which, in fact, turns most of the developments of war surgery. The contaminations were always potential infections and that with a great variety of organisms, some of them pathogenic, others harmless, collected from the various flora of Flanders Field. As time went on it became clear that some period, long or short, must elapse between the receipt of a wound, with its accompanying contamination, and the growth and development of bacteria to an extent properly dignified by the term infection. It is in this interval between the contamination and the development of infection that treatment can most closely approach the ideal, and

upon it attention was increasingly centered as the war went on.

You will all of you remember the more or less burning controversies of the earlier days between the various methods or schools of wound treatment, all of which turned upon the use of one antiseptic or another or one method or another of applying them. Here belong the very interesting experiments in the use of varying strengths of salt solution to which so much time and intelligence was devoted by Sir A. E. Wright. Dakin's solution, particularly in its relation to the so-called Carrel-Dakin method, has occupied a large place in the literature of the time. Then came "B. I. P." and flavine, active competitors in an already crowded field; but, like their predecessors, all of them addressed to dealing with wounds at a time when contamination had developed into infection, and all of them handicapped by the everlasting handicap which weighs down the use of all antiseptics. From time immemorial the wise and the foolish alike have sought for some substance which, brought in contact with an infected wound, shall have the power of penetrating the tissue and destroying the organisms without unfavorably affecting the tissue itself. No such substance has been obtained, and though we have learned that many antiseptics of great bactericidal power are worthless or even harmful because of the damage which they do to the tissue, we have always returned to the basic fact that the only satisfactory method of treating an infection is by preventing it. Undoubtedly "B. I. P." and flavine served a valuable purpose in this war, and it is doubtful whether under conditions of active fighting it will ever be possible to dispense with antiseptics. The great advantage which the introduction of these two antiseptics brought to the surgery of war was that it rendered transportation from forward areas to lines of communication, and ultimately to the bases, possible by checking the spread of infection and minimizing the amount of dressing necessary during this period, which may extend to several days. None of us who lived through it will forget the relief which these two antiseptics brought over the previous methods of wet dressings, frequently changed, which, during 1916 and early 1917, were commonly mis-called Carrel's method. The frequently changed wet dressing was a practical impossibility and therefore a tragic absurdity

during days of active fighting; and the attempt at its execution was often followed by a dreadful mortality whether of life or limb. The introduction of "B. I. P." and flavine enabled wounds to be dressed only at relatively long intervals varying from a few days up to a week and yet to remain in satisfactory condition. But this lengthening of the interval between dressing came about, at least in part, because of a wider acceptance of the axiom of the surgery of this war that all penetrating or so-called lodging wounds in which projectiles and contaminated clothing are retained must be widely opened and at least roughly cleaned, with the removal of foreign material, at the earliest possible moment. Upon the acceptance of this axiom turned practically the whole development of the surgery of the last year and a half of the war. Much credit should be given to Carrel for his early enunciation and persistent advocacy of the doctrine of free incision and careful mechanical cleaning. I think that on the whole the French medical service grasped this truth earlier than the British, though my contact with their work was not sufficient to enable me to express an opinion as to their practicability to carry it out.

#### PRIMARY AND DELAYED PRIMARY SUTURE.

The development of war surgery centered around what is now known as primary and delayed primary suture. I will not take your time by discussing the details of technique but the principles are as follows: Primary suture may be applied to any battle wound, lodging or otherwise, in which contamination has not as yet developed into full blown infection. It depends obviously upon the possibility of thoroughly exposing all portions of the wound to sight, of removing foreign bodies and foreign material and with it damaged or partly damaged tissue. It is further necessary that the space thus left should be such that it can be closed without leaving dead spaces which, where they occur, are practically certain to vitiate the result in a greater or less degree. Much discussion has centered about the length of time after wounding at which such sutures can be carried out; but as our experience increased, it became evident that elapsed hours were only relatively important and that in a proportion of cases, decreasing as time went on, such sutures could be carried out up to a period of



even two or three days. This was far more true of superficial than of deep wounds, and also of wounds in which projectiles did not remain, such as through and through wounds, grazing wounds, and wounds caused by relatively large shell fragments of low velocity.

The term delayed primary suture was given to those cases in which, partly from doubt as to the success of the cleaning process and partly from lack of time on account of pressure of work, it was not deemed safe or possible to complete the operation. Under these circumstances the wound was packed, with or without the use of some antiseptic, and the patient evacuated to lines of communication where the wound would be closed after an interval of from 24 to 72 hours.

In the early days of this work on primary suture, considerable stress was laid upon the importance of taking cultures from varying parts of the wound in the hope that it would importantly affect the treatment. In the long run I do not believe that this was the case, partly because the results of such cultures implied a large element of uncertainty and accident according to the thoroughness with which cultures were taken and the care with which their results were worked out. In war surgery, at least, all this work must be done under pressure and deals with relatively large numbers, large enough at least to swamp the bacteriological establishment of almost any field hospital under the pressure of heavy fighting. It was undoubtedly true that the inclusion in the wound of the hemolytic streptococcus was likely to be followed by a bad result, but my experience leads me to believe that the inclusion of considerable numbers of the gas bacillus group was commonly not followed by any such result. In practice, I doubt if reliance was in fact placed upon laboratory findings in the majority of cases, and in our own work we early discarded them and depended entirely upon the expert judgment of men trained in war surgery for one or two years.

It was not possible to keep accurate figures of this work over long periods of time, but I have here a few which probably represent a fair average of the development during the latter part of 1918. During a period of five days in August, 1918, four hospitals in the Camiers district received 2,008 wounded and operated

upon 749, which is 37%. This figure is probably below the average which was being done at that time as I find that during the same days at No. 22 General Hospital we did 505 operations, probably about 50% of the wounded received. During a period of six weeks from the first of August to the middle of September, No. 22 General Hospital received 5,539 wounded and operated upon 2,047, 36%. This appears to show that during conditions of active fighting, even under the most severe pressure, about 35% of the wounded casualties that arrived at the evacuation hospitals on lines of communication are thought to require operation. During this same period of six weeks, 933 cases were thought appropriate for suture, primary or delayed, and of these 741 were primarily sutured. A much larger per cent. would have been treated by delayed primary suture had it not been for the impossibility of retaining them in hospital for the week or ten days which such cases require, and this does not therefore represent a satisfactory figure upon the relative frequency with which delayed primary sutures would be carried out under satisfactory conditions.

The literature of this subject has now become very voluminous, but until we get a little further away from the heat of battle and the stress of controversy no one opinion can be accepted as authoritative. Thus it has been widely held that primary suture of wounds was relatively unlikely to be successful unless undertaken within the first 24 hours. If this had proved to be true only a comparatively small number of casualties could have been thus treated as this method involves delay in evacuation from forward areas and is quite incompatible with active fighting conditions. Early in August a group of hospitals in the Camiers district demonstrated satisfactorily that cases, the majority of which were from 24 to 48 hours old, could be treated by primary suture carried out by a great variety of surgeons with at least 81% of complete successes and 91% of partial and complete successes. A further continuation of this experiment at No. 22 General Hospital showed that this was true in a series of over 700 cases, many of which were more than 48 hours old. I am therefore inclined to advise that the decision be made upon clinical evidence tending to show whether or not contamination has in fact resulted in in-

fection which has penetrated deeply into the tissue. I am certainly not prepared to accept the widely expressed view that the mere lapse of 24 hours, even in lodging wounds involving fractures, is a contra-indication to primary suture.

In order to discuss this question more intelligently, the cases should be divided into (1) cases involving only the soft parts; (2) cases involving bones but not joints; (3) cases involving joints.

1 Obviously cases involving only soft parts are, other things being equal, more readily dealt with and likely to give better results. On this point I am able to report 479 cases with 410 (86%) complete successes, 16 (3%) partial successes (by which phrase is meant the removal of an occasional suture on account of stitch abscess, without affecting the integrity of the wound), and 53 (11%) failures. The results will, of course, vary with the depth to which the wound penetrates, and in general penetrating wounds of the buttock were best treated by the open method, as were the deeply penetrating wounds of the thigh. Complications, such as damage to the arterial supply, as in the case of the posterior tibial in the calf, would militate against the best results.

(2) It was commonly believed that compound fractures as a complication of lodging wounds could not be submitted to primary suture except in their earliest stages. That this is not invariably true, and that time ought not to be accepted as a positive contra-indication to operation, may be judged from a group of 184 cases done during August and September, with 146 (79%) successes, 11 (6%) partial successes, and 27 (15%) failures. It may properly be admitted that these cases require more skill and judgment than do the wounds of the soft parts, but it is probably not true that failure will have to be paid for at a very much higher price. The osteomyelitis, which is the most serious result of failure, does not appear to me to be importantly worse than that which almost invariably follows upon the open treatment of these wounds. The decision of this point must of course be left until the final results of these never ending cases of osteomyelitis are better known, but at the present time I think there is no evidence to show that serious acute osteomyelitis is importantly more common after failure of primary suture than after open treatment.

(3) Perhaps the most brilliant successes of primary suture are the cases involving important joints, and this has perhaps more application to the conditions of civil practice than any other of these groups. In the early part of the war, the knee joints infected by gun shot wounds were treated by incision, irrigation, and drainage, and even by laying them wide open by transverse division of the ligamentum patellae, flexing the joint to a right angle and allowing the infection to subside when an attempt was made to restore the integrity of the joint. All methods of drainage proved in the majority of cases to be more or less disastrous failures, and it was to this group of cases that primary suture was applied earlier perhaps than to any other group. It soon became an accepted doctrine that excision of the wound with removal of the foreign body, careful irrigation of the joint, and complete closure at least of the capsule was commonly followed by brilliant success. Extensive damage to the bone involving the joint or extensive damage to the cartilage always gave less satisfactory results and, even in the earliest stages and with the best technic, cases of extensive damage to the joint surfaces frequently ended in failure. Shattering injuries, whether of the condyles of the femur or the head of the tibia, came to be generally regarded as requiring either excision or amputation. On the whole, the enormous number of knee joint injuries, even after the lapse of 24 hours, gave excellent functional results if the indications for cleaning and irrigation were carefully carried out and the joint accurately closed, even though complete suture of the overlying soft parts was not done. In probably the majority of cases it was possible to completely suture the whole wound and get primary union and full motion.

Injuries to the wrist joint, which is ordinarily regarded as a difficult joint to deal with, do well under this method by the removal of all bones damaged to any appreciable extent. This might involve the removal of a portion or the whole of the carpus and might even involve the removal of the proximal end of one or more metacarpals, yet the result at the end of two or three weeks was a joint with a reasonable amount of motion and free use of the tendons. This latter was most difficult to obtain in the earlier methods of open treatment and varying degrees of claw hand commonly resulted. Per-

haps the most brilliant group of these hand injuries was the very common through and through machine-gun bullet wound of the palm, involving one or more metacarpals, commonly breaking through into the wrist joint with a varying amount of damage to tendons. Scrupulously careful cleaning of these wounds with suture of the tendons, occasionally of the nerves, and removal of bone fragments, commonly gave thoroughly useful hands, a result which could not have been obtained by open methods.

Much less satisfactory results were obtained in wounds involving the elbow, shoulder, hip, and ankle joints. This was probably due to the anatomical difficulties of thorough cleaning; and particularly in the shoulder and hip joints, really satisfactory irrigation of the joint is hardly possible. Our experience led us to expect infection of these joints with greater frequency and in the cases of the elbow, shoulder, and hip to resort to excision in a larger proportion of the doubtful cases.

#### CHEST SURGERY.

Undoubtedly the experiences of the war have added considerably to our knowledge of the surgery of injuries of the chest. Much greater boldness of treatment developed as time went on, and was justified by the results. In the earlier years of the war it was the general custom not to interfere with large hemothorax due to through and through wounds, on the ground that removal of the fluid was likely to be followed by fresh bleeding. Several observers have pointed out that if it was desired to avoid expansion of the lung this could be done by replacing the fluid removed, by sterilized air or oxygen, much upon the same principle as that used in the production of artificial pneumothorax for tuberculosis. In this way further bleeding could be certainly controlled, but the number of cases to which this procedure was applied probably diminished rather than increased during the latter part of the war, as evidence accumulated to show that large hemothorax, whether or not treated by aspiration, tended to result in crippling of the lung, and that opening of the chest with removal not only of the fluid but the clotted portion of the blood, gave a better late result. Suture of the lung, if bleeding appeared, and particularly the removal of indriven bone, was commonly followed

by much more complete expansion of the lung and not commonly by an amount of infection and empyema that was serious. During 1918 many surgeons of all the Allied group came to believe that in penetrating wounds of the chest with retained foreign bodies these should generally be removed by free incision, cleaning of the track in the lung, removing of bone fragments, drying out of the cavity, and suture of the wound. This procedure was commonly followed by expansion of the lung to a considerable extent and also commonly by the formation of a small encapsulated empyema which could either be treated by repeated aspiration, which was more successful than would be ordinarily expected, or by reopening of the wound. These small encapsulated empyemas commonly did well, particularly with drainage, and the amount of ultimate crippling of the lung with retraction of the chest wall was much less than in those cases in which infection of the hemothorax was allowed to develop, and tying up of the lung became a serious factor in producing a large stiff-walled cavity much more comparable to the post-pneumonic empyemas of civil practice. I have had the feeling that the development of these rather radical measures in chest surgery was still in its infancy and that had the war lasted longer the number of officers who were well equipped as regards technique and experience would have increased to such an extent that the already good results would have become even better.

#### APPLICATION OF THESE PRINCIPLES TO CIVIL SURGERY.

It is clear that the surgery of war, at least as concerns infected wounds, can have but a limited application to the accidents of every-day life. On the other hand there are, particularly in large industrial or railroad centers, a very considerable group of cases in which the injuries do not importantly differ from the wounds of war. Thus the compound fractures with indriven bone and foreign material roughly resemble the lacerated injuries produced by high explosive shells. These can certainly be treated during the early hours after injury by the principles of thorough cleansing through free incision, with the removal of all foreign material and damaged tissue, the resection of the bone fragments, and suture of the wound. Many damaged hands which ultimately give un-

satisfactory results will do better than in the past if these principles are applied. The penetrating wounds of the knee joint which were tended before the war to approach with fear and trembling can now certainly be dealt with boldly and with greater certainty of complete success. Crushing injuries of the chest or the less common stab wounds with division of intercostal arteries will do well when treated more radically than in the past has been the custom. There need be no hesitation about freely opening a chest full of blood in order to suture a bleeding wound of the lung or to tie a divided intercostal under a good exposure. Such cases should do even better than wounds of war since the probability of infection from without is greatly less and the surgeon may confidently rely upon his ability to drain a small empyema, should it occur, with the knowledge that the lung has expanded freely and that the final result will be a great improvement over that which will occur if large accumulations are allowed to look after themselves.

It is perhaps proper to utter a word of caution in accepting the figures which we put out from these hospitals near the fighting line. It is probably true that, even though these men are fatigued and even war-worn, they are still in better physical condition than the average civilian of the modern world; that they show a higher degree of resistance, whether to infection or to the physical insults of operative surgery. It is quite impressive to observe the extent to which these fighting youngsters can be literally smashed to pieces without destroying either their courage or their ability to resist infection. On the other hand it should be possible to surround the problems in civil life which approach those of war with greater niceties of aseptic technic than was for us possible, and it may be that these two factors will so nearly balance each other as to give substantially symmetrical results.

#### EMPYEMA.

BY HOMER GAGE, M.D., WORCESTER, MASS.

The army camps have during the past two years afforded a most unusual opportunity for the observation and study of empyema, and when the experience of them all has been tabulated and carefully analyzed, as it will be, we shall have a contribution to the literature of

the subject of unusual value. Even if it fails to settle some of the problems which we should like to see settled, it will furnish the largest amount of statistical material on empyema gathered under identical conditions during the same period by a large number of different observers, than has ever been made available to the profession.

There were during the mobilization two distinct groups of empyema, common to all the camps. One during the winter of 1917-18, following the epidemic of measles, and characterized by the presence of the hemolytic streptococcus; the second, in the autumn of 1918, following the epidemic of influenza, characterized by the presence of pneumococcus or streptococcus, or both. Both groups gave the impression to those who had them in charge of being quite different from the empyema which they had been in the habit of seeing in civil practice.

It is not easy to define this difference exactly, but it seemed to me that from the surgical standpoint the most striking difference was the opportunity to see the cases very early after the onset. I think in most of our metropolitan hospitals we see cases much later, when the other serious complications have been outlived and more or less resistance to the infection has been acquired. They are more like what we used to call thoroughly ripe abscesses than like acute spreading infections, and the problem as well as the prognosis is quite different. Then, too, the chronic empyemas of tubercular origin were not met with in the army hospitals.

The experience of the last four years in France and Belgium has added very much to our knowledge of chest injuries, widened very much the field of operative interference, and simplified its technique. From this experience we look forward confidently to a decided improvement in the treatment and results of thoracic injuries. It can hardly be said that our experience with empyema has given us equal confidence. There is nearly as much diversity of opinion as to the proper treatment as ever there was, and this diversity of opinion as expressed in the reports from the different camps is the strongest possible evidence that we have not yet evolved a perfectly satisfactory technique.

In a discussion of this subject before the Society at its annual meeting last year, after confessing my dissatisfaction with our results at

Camp Devens, I closed by saying,—“that in a future series I would immediately begin irrigation with Carrel-Dakin solution.”

Well, I have now tried that method and am still disappointed in my results. The mortality is still too high, and the time required for convalescence seems unnecessarily long. But, after all, a careful study of unsatisfactory results is quite necessary to progress, and I am therefore disposed to present mine without apology.

The cases occurring in the early part of 1918 have been very fully studied and admirably reported by Lieutenant Horace Gray, M.C., U.S.A., in the recent numbers of the *BOSTON MEDICAL AND SURGICAL JOURNAL*.

Although the cases which were observed as a sequel to the epidemic of influenza have not led us to any different conclusions, it seems worth while to compare these later cases with Lieutenant Gray's in order to make the record of empyemas at Camp Devens complete. The results as a whole are neither very bad nor very good. I shall refer to the earlier group of Lieutenant Gray as Group 1 and the later cases of last fall and winter as Group 2.

The total number of cases under-observation was 77 and 61—138—as indicated by the following table:

TABLE I.

	GROUP 1			GROUP 2		
	No.	Deaths	%	No.	Deaths	%
Cases operated on ..	43	9	21	45	9	20
Cases not operated on	17	8	47	11	3	27
Undiagnosed until autopsy .....	17	17	100	5	5	100
TOTAL .....	77	34	44	61	17	28

It will be observed that the mortality in the operated cases is practically the same in the two series, or about 20%. In the unoperated cases of the second group we were fortunate in having a larger percentage that improved rapidly after simple aspiration, and a smaller percentage of cases so desperately ill with general septicemia that operation seemed inadvisable.

As we were particularly fortunate in our ability to secure permission for autopsies in these cases, it is believed that the above represents a full and accurate statement of all the empyemas occurring in camp during both epidemics. The incidence of empyema in the first group was 16%, or 77 cases out of 485 pneumonias; in the second group it was 61 cases, out of about 2,000—the exact number of cases

has not been tabulated yet—or not far from 3%—a very marked difference.

TABLE II. TIME OF ONSET OF EMPYEMA

	GROUP 1	GROUP 2
In 1st week .....	27	5
In 2nd week .....	19	1
In 3rd week .....	6	13
In 4th week .....	7	11
In 5th week .....	1	9
Beyond 6th week .....	0	17
TOTAL .....	77	56

Our first case of influenza was admitted to the hospital early in September, but the first case of empyema was not discovered until October 7. In 90% of the second group the diagnosis of empyema was not made until after the second week; while in the earlier hemolytic group 80% occurred within the first two weeks. The same contrast appears between the two groups in the cases reported from other camps and constitutes an essential difference in the character of the infection.

In one set of cases the effusion seemed to occur almost simultaneously with the signs of lung invasion, and was recognized early because we had an opportunity not often afforded in civil practice of seeing a large group from the very onset of infection.

That the more rapid development of the effusion in the first series is partly explained by the difference in the infecting agent is illustrated by the following table:

TABLE III. BACTERIOLOGY OF PLEURAL EFFUSION.

	GROUP 1s.		GROUP 2s.	
	No.	Died	No.	Died
<i>Pneumococcus alone</i>				
Operated cases .....	8	0	24	5
Non-operated cases .....	14	11	4	1
<i>Streptococcus alone</i>				
Operated cases .....	26	8	8	2
Non-operated cases .....	14	10	3	0
<i>Pneumococcus and Streptococcus</i>				
Operated cases .....	7	1	1	0
Non-operated cases .....	6	4	0	0
<i>Unknown</i>				
Operated cases .....	2	0	7	2
Non-operated cases .....	0	0	4	2
<i>Influenza Bacilli</i>				
Operated cases .....	0	0	2	0
Non-operated cases .....	0	0	0	0
TOTAL .....	77	34	56	12

It will be observed that among those cases in which the effusion appeared in the first two weeks of the disease, that is in Group 1, nearly 70% were characterized by the presence of the streptococcus, and only 28.5% by the presence of the pneumococcus; while in those in which the effusion did not appear until after the sec-

ond week, 50% were due to the pneumococcus alone, and only 26% to the streptococcus. This is, however, merely suggestive, and further study of the table shows such a variation in the severity of the same infections that we are again confronted with the unsolved problem of individual resistance and the varying virulence of the same organism under different conditions.

It will be observed that of the pneumococcus cases 50% were fatal in Group 1, and only 20% in Group 2, and nearly the same proportion prevails in the streptococcus cases. It is obvious that a more virulent type of both organisms was present in the first epidemic, and that such conflicting figures in small groups can afford no definite conclusion.

A study of the operations is more productive. Lieutenant Gray refers to the hesitancy of the surgical service to adopt early interference, and plainly indicates the feeling of the medical service that the presence of a positive culture of streptococcus, and even of pneumococcus, should determine an immediate operation.

The following table shows the difference between immediate and delayed operations:

TABLE IV. TIME OF OPERATION.

	GROUP 1. No. Died	GROUP 2. No. Died
On 1st day of empyema..	6 3	17 5
On 2nd day of empyema..	10 4	7 3
On 3rd day of empyema..	2 0	5 1
After 3rd day of empyema	25 2	16 0

The significance of this table lies in the fact that both groups show unmistakably that a heavier mortality follows hasty interference—a conclusion that was reached by the Empyema Commission at Camp Lee and seems to have been confirmed by the experience of every army camp from which reports have thus far been published. It is the one positive conclusion in regard to the treatment of empyema which can be drawn from the experience of the past year that seems likely to stand as a guide for future practice.

Preliminary aspiration, the character of the fluid, rapidity of re-accumulation, and the degree of mechanical interference with respiration are all important factors in determining the time for operation. The great thing is not to be in too much of a hurry. There are few conditions that call for the exercise of a sound surgical judgment more imperatively

than this. Each individual case must be carefully watched and studied with the aid of the clinician, the laboratory, and the roentgenologist. No hard and fast rule as to the exact day can be entertained, except that the first few days after the onset of the empyema are always to be avoided.

Unfortunately there is less unanimity about the kind of operation than about the time of it. As stated in the discussion of last June, our preference is still for the minimum amount of operative interference consistent with the establishment of free drainage; and for adults we still believe that a rapid thoracotomy under local anesthesia best fulfills these indications.

For the primary operation in acute cases this should be, we think, the procedure of choice. In about 60% of the cases that recovered, this was all that was necessary. In the remaining 40% a secondary costatectomy had to be done. I believe the second operation was due more to failure of our after treatment than to the inefficiency of the first. Our chief consideration must always be the saving of life. The shortening of the period of convalescence as well as the avoidance of a secondary operation must not outweigh the risk of a higher mortality.

The question of how long a discharging thoracotomy wound shall be allowed to drain before resorting to secondary interference is important. There should be immediate alleviation of symptoms such as dyspnoea, harassing cough, and high temperature. Recurrence or persistence of these or any of them demand careful clinical and x-ray study of the chest to determine the efficiency of the drainage.

In view of the splendid results of secondary costatectomy obtained by Major Sanders, my successor at the Base Hospital, I am satisfied that we waited too long. In a large number of cases, through a long incision he has resected portions of two ribs, left the wide opening into the pleura without suture, and immediately started Carrel-Dakin irrigation. The result has been a rapidly healing wound without any mortality.

By the earlier adoption of this method I believe we might have materially shortened the period of convalescence, which averaged in our series of cases something over 90 days or 3 months. In comparison with the length of hospital residence in civil life, it must be remembered that those men had to be kept until their

wounds were entirely healed and they were able to return to barracks life. They could not be treated and dressed as out-patients or at home.

In both groups the after treatment consisted in most of the cases in simple drainage. In several of the second group the Carrel-Dakin irrigation was instituted immediately after the operation, and in a large number of instances it was tried later in the hope of speeding up convalescence. Little advantage was observed in these cases in marked contrast to the rapid improvement which has followed the use of the Carrel-Dakin method after the free opening above referred to.

The question naturally suggests itself—Is this result due to the Dakin solution or to the wide incision? I cannot but feel that the return to the good old surgical principle of large openings contributes more to success than the irrigation. The more radical operation cannot displace thoracotomy as the primary procedure on account of the danger to life, but it can with advantage be undertaken as soon as the patient's general condition will permit if the local condition is not showing satisfactory progress.

A study of the autopsy findings in the fatal cases shows that in addition to the empyema there were present in three cases, general peritonitis; in 3, purulent pericarditis; in 2, an undrained encapsulated empyema; in 2, abscess of the lung; and in all the peribronchitis and bronchiectasis characteristic of influenza.

It seemed quite obvious that the purulent pleuritis was but one of the local manifestations of a general septicemia, having its origin in the air passages. Drainage of the pleural cavity does not remove the primary focus, nor does it eliminate the infection of the pericardium or peritoneum. These are all important factors in determining the ratio of mortality as well as in controlling to a very large degree the period of convalescence, and they can be removed or modified only by a natural or an artificially induced immunity.

The purely mechanical problem of establishing efficient drainage of the pleural cavity seems capable of solution in a variety of different ways, as well as any, we think, by the method already outlined; but the extent to which complications of lung abscess, pericarditis, and peritonitis are met with in any given group of cases will always have a more important bearing on

the results than the method used in removing the pus from the chest and preventing its re-accumulation. It is the unknown factor which makes a statistical study of this subject always interesting, often instructive, but usually very inaccurate and unconvincing.

#### EMPYEMA IN CHILDREN, WITH SPECIAL REFERENCE TO DIAGNOSIS.

By FRANK SPOONER CHURCHILL, M.D., BOSTON.

The war has unfortunately furnished ample opportunity for the study of empyema as it occurs in adult males, with a corresponding flood of literature thereon. Naturally, these articles have not dealt with the condition in infants and children, and in civil practice there have been no special studies on the subject at those ages. Nevertheless, in response to the invitation of the committee to present a paper on empyema in children, it has seemed worth while to take up certain aspects of the disease, *viz.*, its apparent obscurity and the frequent failure to detect its presence. The paper, therefore, will deal chiefly with the diagnosis of empyema and seek to discuss some of the difficulties met in its detection. It is based on observations and clinical studies made of both children (including infants) and adults,—on infants and children at two large children's hospitals over a long period of years; on adults at two base hospitals covering a comparatively short intensive period of ten months. In each of these hospitals an epidemic of pneumonia and empyema occurred during my term of service; at Camp Stewart, Virginia, in the spring of 1918; at Camp Deven, Massachusetts, in the fall of 1918. Thus there has been excellent opportunity for a pediatrician to make a comparative study of empyema as it manifests itself at different periods of life, and perhaps to give him a clearer insight into the difficulties encountered in the detection of disease. These difficulties appear to be due to the infrequency of empyema, its insidious and gradual onset, the obscurity of its physical signs, and erroneous interpretation of the physical signs detected.

The condition is relatively infrequent in children: it developed in 5% of 824 cases of lobar pneumonia and in 11% of 557 cases of bronchopneumonia, treated in the wards of the Children's Memorial Hospital during the last ten

years; while during the same period, only 180 cases presented themselves as such at the out-patient department, practically all undetected outside.

The onset of empyema is gradual, insidious. It is practically never primary, but almost invariably secondary, a complication, and like all complications apt to be overlooked, the mind of the clinician being centered on the original primary disease. This primary disease most commonly is pneumonia, though occasionally empyema may complicate measles, scarlet fever, tonsillitis, appendicitis, and acute arthritis. Its gradual insidious onset in pneumonia is attested by the fact that fluid is found not infrequently in the pleural cavity, before crisis:—the "*Pleurésie parapneumonique*" of the French. Thus, Jerdine, working in the wards of the Children's Memorial Hospital, found fluid in 40% of a small series of cases of pneumonia before crisis, the fluid being small in amount,—1 to 5 cc. on aspiration,—sero-fibrinous and sterile in character. (It was demonstrated sometimes by physical signs, sometimes by roentgen ray, and by puncture.) These conditions represent the beginnings of a possible empyema. Fortunately, few of them "ripen"; in most of them the exudate does not affect the clinical course of the disease and is presumably absorbed.

As the first step, then, in the diagnosis of empyema, the physician in attendance upon a case of pneumonia should bear constantly in mind the possibility of an empyema arising as a complication, even though this possibility become a certainty in only five out of every one hundred cases; his mind thus prepared, he will then note certain departures from the natural course of pneumonia, certain symptoms, or "danger signals" which the child hangs out when a purulent pleurisy is developing. These symptoms are general and local, with special reference to the respiratory tract. In cases ending by crisis, they may be noticed in from one or two to ten days after crisis. In cases ending by lysis, they develop imperceptibly, the slowly subsiding pneumonia apparently merging into the developing empyema. The general condition of the child is not good; he looks and appears more sick, is drowsy, begins to have the septic look of a patient harboring a pus focus. The respiratory curve

stops its downward convalescent course, remains stationary, then begins to creep up, even before an increase is noted in the pulse and temperature; the breathing, however, is not labored. To be correctly interpreted in the child, both respiration and pulse should be taken while the patient is asleep. The changes thus noted suggest either a recrudescence of the pneumonia or some complication. Among the complications must be considered otitis media, empyema, pericarditis, pyelitis, meningitis, appendicitis, and arthritis.

Physical examination of the child now follows. Lack of thoroughness in this examination and inability correctly to interpret physical signs are the main reasons for failure to detect a pleuritic effusion, whether serous or purulent. The examination must be thorough, minute, and in the infant or child is often a most difficult matter. That the fluid can be discovered promptly, however, by physicians specially trained in pediatrics is evidenced by certain comparative groups of figures, *viz.*, in 43 cases of pneumonia treated in the wards of the Children's Memorial Hospital and complicated with empyema, the latter condition was detected on the average on the eighth day from the beginning of the pneumonia, whereas in the series of 180 cases of empyema detected in the out-patient department, cases in which the antecedent disease had been handled in the home, the empyema was not discovered until the 41st day, on arrival in the out-patient department. Thus the early detection of fluid in the pleural cavity is evidently dependent upon care and skill in physical examination. The examination should be made at least once daily until the source of the complicating trouble is run down. The general condition, septic look, and rapid breathing, have already been noted. Attention is directed chiefly, of course, to the chest. Here the signs dependent upon the amount and location of fluid may be at first clear, and well defined, and susceptible of but one interpretation; or obscure, difficult, and susceptible of various interpretations; later they are clear and definite. If there be a considerable amount of fluid, not encapsulated, the signs are generally unmistakable: On inspection, the affected side is seen to move less, is more prominent; the intercostal spaces are less distinct, even obliterated.



ated; if the heart beat be visible at all, the apex is seen to be displaced. On *palpation*, the vocal fremitus elicited by the speaking or crying child is diminished or absent on the abnormal side: if the chest wall be thin, râles are often felt over the other side: an accompanying bronchitis.

*Auscultation* is of great importance; both lungs and heart should be interrogated by this method. The respiratory murmur over the lower part of the chest, especially posteriorly, is absent, diminished, or feebly bronchial in character. It is the last-named characteristic when present which is apt to throw one off the track and point apparently to an unresolved pneumonia; but the voice sounds are diminished, there are no râles, and no friction rub.

On the part of the heart, the position and quality of the apex beat must be noted. This is a most important point and one most frequently ignored by the attending physician, be he hospital intern or the older ward-surgeon. In infants and young children, it must be remembered that the apex beat lies higher and further out than in older children and adults, and that even in these younger individuals, its position is variable. Hence, it is not sufficient to say that the apex beat is in its "normal position": the answer so often received when one inquires as to its locality. So important, indeed, is this point that interns in children's hospitals are trained to note in the records of their initial examination of all cases the location of the apex beat as to intercostal space and distance from either the median or the left mammillary line: thus there is established the position of the beat as a base in the individual child, and subsequent daily observations will show whether or not the beat is being pushed away from that base. With a considerable amount of fluid accumulating in the pleural cavity, it is pushed away. It is not, however, diminished in vigor in pleuritic effusions; the fluid does not overlie the apex; it is not "drowning" it out, as in pericardial effusions, but is pushing the whole heart to one side. Consequently the beat does not have the muffled sound noticed in the latter condition,—an observation of value in differential diagnosis. *Percussion* shows marked dullness over a large area, merging into flatness in the lower part of the chest. The dull-to-flat area is much

more diffuse than in pneumonia, has not sharply defined edges, as frequently happens in the latter disease: the approximate level at which flatness begins is noted, auscultation now is practised again, and it is found that above this line respiration is bronchial and the voice sounds increased, while below it, both respiration and voice sounds are diminished or entirely absent. Percussion of the heart, if the effusion be large in amount, shows the line of dullness to be pushed to the right or left, according to the side affected. Likewise with large effusions, the abdominal viscera, liver, or spleen are apt to be pushed downward.

Such, briefly, are the signs produced by a fairly large amount of fluid in the pleural cavity. They are produced by no other condition, and if present as thus described, leave no doubt of the presence of such fluid, the character of which must then be determined by thoracic puncture. Unfortunately, however, the clinical picture is rarely so clear as I have described, especially in the early stages of empyema, with fluid small in amount or encapsulated. Here the signs may be most obscure, and this obscurity is met with more frequently in the infant and child than in the adult. Inspection and palpation of the chest may reveal nothing abnormal. Auscultation may show the heart apex not displaced, but sooner or later will reveal signs on the part of the lungs which, occurring in the wake of a pneumonia, are at least suggestive and necessitate exploratory puncture of the chest: these signs are a much diminished or faintly bronchial respiratory murmur over a limited area, generally at the base posteriorly, without râles or friction rub, a voice sound distant yet increased in intensity in comparison with the voice heard at the corresponding point on the other side. Occasionally, distinctly amphoric respiration has been heard over this limited area. I have noticed this not infrequently in children, only twice in adults. The sign, of course, suggests a pulmonary abscess, but in all the cases cited operation subsequently showed an empyema. Percussion over this limited area gives an exceedingly dull-to-flat note. These are the signs of either fluid, small in amount or encapsulated, or a pneumonia; only the exploring needle can settle the question. Given such signs late in the course of a pneumonia, the needle should always be used.

Two other aids to diagnosis of a pleuritic effusion need further mention, the one often confirmatory though not conclusive, the other final and decisive: the roentgenogram, and exploratory puncture of the chest.

The x-ray picture is of interest, often helps in locating a fluid, but is by no means conclusive, as practically the same degree and shape of shadow may be produced by a pneumonic consolidation or a pleuritic effusion; the latter, however, is generally more extensive than the former, and furthermore increases in extent from day to day,—a change not likely to take place in the late stage of a pneumonia. Hence the value of daily exposures in a suspected empyema. The two conditions, however, consolidation and effusion, have been confused with each other, as has been shown at autopsy.

Puncture of the chest with the exploring needle is the final arbiter in the question of empyema and should always be practised when fluid is suspected: in the undoubted cases, to determine the character of the fluid; in the doubtful cases, to determine the presence or absence of fluid, as well as its character. Repeated punctures may be necessary: sooner or later, they settle the question.

It is the cases with obscure physical signs which give difficulty in differential diagnosis. The conditions likely to be confused with empyema are an unresolved pneumonia, pulmonary abscess, and pericardial effusion.

The question of an unresolved pneumonia has already been partly discussed; in addition, this lesion usually gives a dull rather than flat note, louder and more distinct bronchial respiration, rales crepitant, sub-crepitant, and fine moist, and a considerable degree of bronchophony. It likewise gives a more marked leucocytosis and marked diminution of the chlorides in the urine. Pulmonary abscess is rare in children; persistent and amphoric respiration, and a tympanitic quality to the percussion note over a limited area point to this lesion. In several instances, the question was not settled until operation showed it to be an empyema. Pericardial effusion may simulate a left-sided pleuritic effusion. The area of dulness, however, is peculiar and characteristic, being pear-shaped; furthermore, the heart sounds are muffled and indistinct. The x-ray is of value in detecting this condition.

I am under obligation to Drs. John L. Morse

and James S. Stone for access to the records of the Boston Children's Hospital, and to Miss B. M. Henderson, superintendent of the Children's Memorial Hospital (Chicago), for preparation of statistics.

#### SUMMARY.

Empyema in children is relatively infrequent, developing in only about 5% of cases of lobar pneumonia.

It is gradual in onset. In all cases of pneumonia, the possibility of its development should be borne in mind and the primary, original disease carefully studied.

Its early diagnosis with fluid small in amount is often difficult: late diagnosis with fluid considerable in amount is easy.

The diagnosis in infants and children is more difficult than in adults.

Exact examination of the chest, performed daily, is often necessary to detect the condition.

A displaced apex-beat is an important diagnostic sign.

In all cases of pneumonia where fluid in the pleural cavity is suspected, the exploring needle should be used, and if necessary, repeatedly.

#### DISCUSSION.

DR. LINCOLN DAVIS, Boston: As Dr. Gage said, the results of the surgical treatment of empyema depend so largely on the nature and extent of the infection that I think it is very difficult to compare statistics in different epidemics and in different localities.

I have had a very small experience with empyema as compared with Dr. Gage, but I did, in the winter of 1917-1918, see a number of cases from negro labor battalions which came into Base Hospital No. 6 at Bordeaux. These troops were employed as stevedores on the docks at Bordeaux. They were mostly Alabama and Southern negroes and seemed to have no resistance to the French climate. At any rate they came in with pneumonias in great numbers and quite a percentage of them developed infections of the serous cavities, which to me were a revelation. There would be a purulent infection of both pleural cavities and pericardium, and in many cases a peritonitis as well. The futility of draining one pleural cavity in such cases can well be imagined. I think in those rapidly fulminating cases surgery seems almost hopeless. Certainly in such cases one would feel that it was wise, as Dr. Gage said, to delay and not to operate during

the fulminating stage, but to tide over with tapping until the process localized itself, if possible; and if it does not localize, there will be a natural selection of cases which will improve the operative mortality at any rate.

Now there are just a few points which I want to speak of. With the exception of that class of fulminating cases, I feel that early operation is indicated. I mean by "early" as soon as frank pus has appeared in the pleural cavity, and before tough adhesions have formed. In adult cases I feel that resection of a rib is indicated under local anesthesia; and if care is taken, I feel that this operation can be done without any pain or shock. I have seen very sick men operated in this way under local anesthesia, without any shock and without any pain, and I am sure it can be done painlessly though it takes longer. Then, of course, getting your drainage at the bottom of the cavity is extremely important. Now for a great many years it has been considered a desideratum to get an air-tight suction drainage of the chest, and a great many ingenious devices have been brought forward which have more or less secured this result.

It has been my privilege to see a great deal of the Italian military surgery, and in Italy they are very conservative as regards wounds of the lungs and chest, and as Dr. Cabot mentioned in his paper, they employ artificial pneumothorax almost entirely in their treatment of war wounds of the lungs. Of course, we are not discussing that now, we are discussing empyema; but I had the privilege of working in an American Field Hospital alongside of an Italian Field Hospital which treated only wounds of the lungs, in the Eleventh Italian Army Corps, and they had there 150 lung wounds which I had opportunity to follow. Those were all treated with artificial pneumothorax. In the cases in which empyema developed, Major Morelli had a very ingenious method of treatment. He made a thoracotomy, resecting a rib, and then he inserted into the wound a drainage tube which is surrounded by a dumb-bell shaped rubber bag, and when that is passed into the wound the rubber bag is inflated with air with a syringe, so that it fills the wound and makes really an air-tight closure of the wound. The tube and bag are held in place by a sort of metallic spider which is held by an adhesive plaster (illustrating). I have seen a great many of these in use and they are air-tight. Suction drainage is obtained by connecting the tube with a series of bottles, one bottle for irrigation of the pleural cavity, and two bottles at different levels which create a vacuum in the pleural cavity by the force of gravity. These bottles are connected with a water manometer so that you can see whether there is positive or negative pressure in the chest. In wounds of the lung Morelli main-

tains positive pressure in the chest to keep the lung collapsed and to prevent the wound from reopening, and he gets perfect drainage with a positive pressure in the pleural cavity. When he thinks the wound of the lung is healed, he gradually lowers the pressure by reversing the position of the bottles until he gets a negative pressure in the pleural cavity and then allows the lung to expand. This apparatus is very simple, reminding me the moment I saw it of the Hagner bag which was devised for the arrest of hemorrhage after prostatectomy; it is on the same principle, and I think it is a practical and ingenious method of getting an air-tight closure of a wound in the chest wall.

DR. WYMAN WHITEMORE, Boston: I am also very much interested in a closed air-tight suction apparatus. This is based on five general principles. First, early operation. Perhaps "early" is a wrong word to use, but when the aspirated fluid is turbid with 60% or more of polymorphonuclear leucocytes and the organism causing the empyema, then I believe in operating. Instead of finding a definite walled off cavity with the lung partially collapsed, one finds the lung compressed, and this lung will rapidly expand when the fluid is let out, provided no air is allowed to enter into the pleural cavity. Second, the necessity of allowing the fluid to escape slowly. In a large empyema, if the fluid is allowed to escape rapidly, I believe there is great danger of collapse of the patient and even sudden death. Third, sterilization of the pleural cavity by Dakin's solution. Fourth, suction of the pleural cavity. Fifth, prevention of a considerable pneumothorax.

\* In cases in which the technique has been carefully carried out, when they are sterile, the x-ray has failed to show any pneumothorax at all in many cases, and in others only a small one between the diaphragm and the costal border.

I do not wish to take time to go into technique except to say that the operation can always be done under local anesthesia. There is no shock to it and no pain when one is familiar with the steps. I have had 70 cases operated on in this way, and this series is made up of the same kinds of empyemas as everyone else has had. I have lost four cases,—a mortality of between 5% and 6%. There is no question that the patients that receive the best, intelligent after-care are the ones who get well quickest.

There may be some who are skeptical as to the efficacy of this method, and to them I would say that although this method has not cured every case, yet it is a distinct contribution to make towards ultimate recovery, as it will often tide a patient over his extreme septic condition, and later on any operation that is necessary can be done.

DR. ERNEST A. CODMAN, Boston: This whole meeting has been extremely interesting to me because I have had the opportunity to see some of the results of the cases about which Dr. Cabot, Dr. Cushing, and Dr. Gage have been talking. Although I have held a commission for only ten months, I saw at Camp Taylor in Kentucky the results of about  $\frac{2}{125}$  of all the American wounded as they passed through my surgical service. Perhaps 30 to 50 per cent. of these cases still needed treatment by secondary operation or dressings. Of course, Dr. Cabot and Dr. Cushing saw at the front open wounds, but necessarily they could not see how the wounds came out, and I think  $\frac{2}{125}$  would show a pretty fair average of the whole. The majority of the cases which came through this hospital evidently had not healed by first intention. Whatever the Carrel-Dakin or other treatments did at the front, they did not, as a rule, produce the scars characteristic of first intention. There were enormous scars of all sorts which showed septic healing, or were still unhealed; but it was marvellous to see how good the results were on the whole. I was perfectly astonished to see the extent of the masses of muscle and tendon that had been taken away, and yet observe that the patients retained the function of the limbs. The surgery must have been good at the front to produce such results.

As far as the neurological cases go, there were cases where apparently the whole side of the arm or leg was gone, nerves and all, and yet the function of the nerves remained. Some of them must have been cases which they treated over there, as Dr. Cushing said, by making immediate suture of the nerve and placing it in the little muscle that was left. So that saving the nerves and tucking them away in the masses of muscles must have done the work, and the cases were splendid on the whole.

We saw a great deal more than  $\frac{1}{125}$  of the peripheral nerve cases. I also had the opportunity at Fort Sheridan to see more than 300 such cases all gathered together in three wards, under Dr. Dean Lewis. The striking thing about these cases was, that the unassisted process of nature restored many of them while they were waiting for transfer to the nerve hospitals. Altogether I was impressed by the tremendous recuperative power of these young men. There was a tendency of nature to repair of which I had not dreamed, in seeing the average case at home of what we call civilian surgery.

Now as to empyema—at Camp Taylor there was probably more empyema than at most of the other camps. We came to the same general conclusion which Dr. Gage has expressed; that is, the idea of postponing operation until the crisis of the septicemic infection and pneu-

monia was passed. Dr. Gage's experience here at Camp Devens was similar in many ways, as shown by the articles which have been written by the medical men at both camps; if you compare them, they are parallel to a great extent. But there is one thing on which we differed. At Camp Taylor we found that a closed drainage, a valvular drainage, introduced so that no air got in, was more effective than an open wound treated with Dakin's solution. Dr. Whittemore has practically the same idea, and I think we may say that there is one thing the war has taught us in regard to empyema in general and that is that open drainage permitting immediate collapse of the lung has gone forever. In the future we are not going to do the old open empyema operation.

If any of you go to Atlantic City to the American Medical Association meeting, there will be on exhibition this little tube which was used at Camp Zachary Taylor and which is a practical thing that any surgeon can make out of the material in his own operating bag, and yet it will remain air-tight and do the work, with less mortality, less pain, less ward attendance, and less nursing care than the old operation.

## Original Articles.

### DIPHTHERIA, THE UNCONTROLLED.\*

BY BERNARD W. CAREY, M.D., BOSTON,  
*Epidemiologist, Massachusetts State Department of Health.*

In choosing "Diphtheria, the Uncontrolled" for a title for this paper, it was not intended to belittle the results which had been obtained in past years, but rather to show that with more intensive effort a further diminution both in the incidence and mortality rates can well be effected.

It cannot be denied that much progress has been made in the control and prevention of diphtheria outbreaks, but with an average of 6,500, or more, cases being reported yearly, with approximately a 10% fatality, we cannot in truth say that we are progressing with endemic diphtheria.

Save in that period immediately following the introduction of antitoxin, there has been no marked interruption in the incidence or mortality of the disease. During the pre-antitoxin days, the average fatality percentage was about

\* Read at the meeting of the Massachusetts Association of Boards of Health, April 24, 1919.

28, while in the next 20 years, from 1895-1915, we see an average of 11.5%, and for the next four years the average is little less.

Because of this stability of both mortality and fatality percentages for the past 17 years, the department investigated 1000 deaths which occurred from diphtheria in this state hoping to ascertain what factors might be present and common to all of these deaths, to fix a theoretical responsibility, and to plan, as far as possible, for their prevention in the future.

These statistics furnished much food for thought and some of our findings were truly startling. Some of the more unsuspected findings were that 31.5% of these deaths occurred in individuals who have been sick one week or more without medical attention; 11.8% occurred in individuals who were moribund at the time of the doctor's first visit; 7.6% occurred in individuals in whom the condition was unrecognized until it was too late for the antitoxin to be efficacious, and 65% of these deaths occurred in children who were 5 years or under.

The source of infection was given as unknown in nearly 90% of these deaths and the form of the disease, in order of frequency, was laryngeal, pharyngeal, and nasal.

These findings can only permit the conclusions that the warnings issued by you for prevention of this infection have not made the impression that they should have and that unless some special attempt is made to awaken responsibility in people for the care and well being of those entrusted to them the story of yesterday will be repeated tomorrow.

From these investigated deaths, it appears that more attention must be paid to this group of individuals who fall within a pre-school age group, and intensive effort made to bring both to the profession and to the laity a more complete knowledge of the prevention and control of diphtheria.

I feel that we cannot be accused of allowing our wishes to run away with our judgment when we state that the time will come when the Schick reaction, with its more frequent and intelligent use, will place a large percentage of the non-immune under our care for immunization, and if the statistics of the New York City Department of Health are correct, this means that our prevention will be in direct proportion to the efforts which we expend. With 60% of the children

of the pre-school age, that is under 6 years, needing immunization, which is available for them, is there not a chance for preventive work which will be really worth while?

The work done by New York has clearly demonstrated the value and safety of immunization by this toxin antitoxin mixture. Dr. Park gives statistics of over 4,000 children, 1,000 of whom were about one week old, who have been immunized with this mixture, and no case of diphtheria has developed up to date among those so immunized.

It may be that it is not wholly appreciated just how much responsibility for this continued high incidence of diphtheria lies with the boards of health of the cities, yet statistics taken from the Census Bureau show that over 80% of diphtheria deaths occurred in cities of over 10,000.

Viewed from this angle, the problem is placed at the door of the large boards of health; for, together with the largest percentage of cases and deaths, they also have or ought to have the necessary personnel and equipment for the prevention and control of the condition. Every city of this class has school physicians, school nurses, laboratory facilities, stations for the distribution of antitoxin, and the necessary regulations to enforce, by law if need be, quarantine and isolation.

What manner of excuse can be offered to explain our seeming apathy when asked by one who knows that all the necessary agents for the eradication of diphtheria are available, "Why do you have the same fatality percentage year after year?" What can the physician offer to the man who knows that diphtheria is curable, if treated early and with sufficient dosage of antitoxin, when he has had opportunity for the use of all of these by having been called upon the first day of the child's illness and has not made use of them. It appears that such a question would cause much consternation to the man who still persists in diagnosing diphtheria by odor, or by the appearance of membrane.

In the near future the time honored "waiting for a report from the laboratory" will not absolve from blame the doctor who has been negligent for the dietum offered by the public health workers that a throat needing a culture for diagnosis should have antitoxin administered at the time of taking the culture is fast spreading to the laity, and they will soon learn to expect

such procedure from the physician to whom they entrusted their welfare.

Lest these observations might be taken by some to be criticisms, and if so taken should fall into that, the most harmful of criticisms, namely, destructive, I hasten to offer the plan that has been adopted by the State Department to effect a diminution of this disease.

I wish to offer for comparison these two facts. 1st. that for the prevention and control of diphtheria all necessary agents are at hand; 2nd. that, notwithstanding the accuracy of this statement, diphtheria is endemic in our state, possessing a fairly even death rate year after year.

As was earlier stated, ignorance as to the possibility of a sore throat being diphtheria, and the resulting delay in calling a physician, appears to be the largest single factor in our deaths. Our first hope for success, therefore, must lie in the application of special educational procedures to this problem, which will bring this knowledge of the possibility of a sore throat being diphtheria and of the necessity of calling the doctor early into the homes of those people who need it most.

To accomplish this, a special bulletin was prepared for distribution among school children, telling in plain, non-technical language a few diphtheria truths. It is hoped that they will carry this bulletin home to their mothers; and because it is brought home from school by their children it is believed that it will receive special consideration. Articles were prepared for newspapers again calling to the attention of our people some diphtheria facts, mainly, the necessity of calling the physician early in sore throat, and the value of antitoxin, both as a therapeutic agent and as a prophylactic agent for those who have already been exposed.

Nursing agencies, Parent-Teachers' Associations, and Women's Clubs have been circularized with letters from the office asking that they help augment the work the local board of health is doing by spreading the information that sore throats must not be neglected and that the possibility of their being diphtheria must be ruled out by proper cultural procedure.

With this augmentation there should appear some improvement in the early diagnosis of diphtheria and our percentage of unrecognized cases should become greatly reduced. Should it become as evident to the laity as it is to us that the mortality of diphtheria is almost in direct

proportion to the delay in calling a physician and the administration of sufficient antitoxin, there surely will be a greater attempt to fulfill this requirement for a speedy recovery from diphtheria; when they know that practically all who receive antitoxin within the first 24 hours of onset recover, 95% on the second day of onset, 87.5% on the third, 78% on the fourth, 61% on the fifth, and less than 50% on the sixth day, their sense of responsibility will be more keen with resulting activity.

The dosage of antitoxin has been much discussed and without doubt will always vary; however, with a total of 27,000 units distributed by the department for each case reported, it appears that ample dosage is being used in most instances, together with sufficient antitoxin for immunization. There are two facts which everybody admits: that to have this medication effective, it must be given early and it must be given in sufficient dosage; to this we add the suggestion that in all those cases which are seen late in the disease you will not forget to mention that antitoxin may be given intravenously without harm and occasionally with most marked results.

The usual epidemiological procedures for controlling diphtheria are too well known to need discussion, and save for the later work done with the Schick test and the toxin antitoxin mixture for immunization, there is scarcely anything to offer. Culturing of schools has long produced good results and where completely carried out with re-culturing, when necessary, gives us a real method of control. In some instances, however, it has been noticed, the culturing stopped with the inmates of a certain school room; neighborhood contacts playmates, and visitors to the homes of those ill have not been done. Might it not be that there would be a greater chance of infection among those who come into close contact playing at games, than in those whose chance for contact infection would lie in sitting in the same room at school? This is not intended as a criticism of school culturing, but rather to urge a combination of culturing for both school and neighborhood, thus culminating a possible unknown or undetected source of infection. Does not the fact that 65% of our deaths are in pre-school age groups point to the necessity of such a procedure? It is our belief that here lies one of the greatest factors for the continued high morbidity and that with the in-

creased activity of your agents you will surely obtain results toward the desired end.

One other suggestion: the local boards of health, in the large majority of instances, receive notification that a culture is positive and they in turn notify the physician. It seems as if here is a chance, at very little expense of time or money, to suggest, and, if need be, send to the doctor the antitoxin necessary not only for the treatment of the patient but also for the immunization of all contacts.

Actual experience has shown that in some instances the doctor had an insufficient amount of antitoxin for the patient and contacts, so used that which he had for the treatment of the patient, leaving immunization until the next day. Would it not be possible, as a routine procedure, to telephone to the doctor, telling the positive culture and at the same time asking how much antitoxin he will need for the patient, and how much for the immunization of contacts so that, if need be, you might send to him at once?

If such procedure were followed, you will have done two things at least: you will have reminded him that such a procedure of immunizing contacts is a good one; you can tactfully suggest dosage, if it is thought advisable, so that you may be sure the necessary amount will be given; and, finally, you may rest in the consciousness of having done your full duty both to your city and to the people.

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## BRONCHITIS. THE MOST SIGNIFICANT DISEASE OF THE WAR.

BY GEORGE A. SOPER, PH.D., NEW YORK,  
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BRONCHITIS is the most significant disease which has occurred in the army in the war, not omitting influenza. It is significant, first, on its own account; second, because of its connection with other respiratory diseases, and third, for the reason that it provides means for the spread of infections which, although not strictly respiratory, are believed to be transmitted in the respiratory manner.

Bronchitis was the most prevalent disease of the war. Not only was it associated with the exanthemata, but it occurred as a separate and independent infection. In fact, the occurrence of bronchitis was well nigh universal in the

army and navy camps during much of the year 1917-1918. Within about ten days after their arrival, newcomers were usually attacked, their symptoms often being pronounced from the start. In the barracks, mess halls, lecture rooms, and places of amusement, and on the drill field, coughing was often continuous. This was especially so during November, December, and January.

What passed as bronchitis was often really pneumonia. Outside of the hospitals the bronchitis was not always diagnosed correctly, especially in its early stages. Many cases were called bronchitis from their symptoms alone, but a far greater number of genuine cases of bronchitis passed merely as "colds." Of the total number of cases which occurred in the army it is believed that relatively few went to the hospital. In numerous instances pneumonia followed bronchitis.

The bronchitis which occurred in the army and to which reference is particularly made in this brief paper possessed the following clinical features as observed by the medical staff of a large general hospital.

It was an acute infectious inflammation affecting in rapid succession downward the nasopharynx, larynx, trachea, and first and second divisions, usually both sides, of the bronchial mucosa. The symptoms were coryza, rigors, hoarseness, soreness of throat, weakness, oppression, muscular soreness, and slight fever (100-101). In severe cases the temperature might be to 103 with correspondingly rapid pulse, substernal soreness, and tightness of the chest.

The cough was at first dry and unproductive. It frequently occurred in paroxysms, causing muscular pain and soreness along the costal margins at the attachment of the diaphragm. On about the third or fourth day, the cough loosened and expectoration appeared. It was at first scanty and mucous; later abundant and mucopurulent. Upon palpation and percussion only negative results were obtained. On auscultation, sibilant and sonorous râles could be noted, except when resolution began, when fine and coarse mucous râles were to be heard. The breath sounds were somewhat harsh.

A positive diagnosis of bronchitis was impossible unless harshness and breath sounds, sibilant râles and sonorous râles were audible, or in the stage of resolution, fine and coarse mucous râles were to be heard.

When associated with another disease, resolution in the average case was complete at best within a week. The attack often continued for many weeks and occasionally lasted for months. It was a common saying among the soldiers that the "bronchial cold," which attacked them soon after their enlistment, remained with them as long as they stayed in camp. It rarely disappeared entirely. The characteristic hard, explosive cough remained long after all other symptoms had gone. During an acute period, it not uncommonly unfitted a man for duty. There are but few soldiers whose efficiency has not been impaired by it. Except during the period of the influenza pandemic, nearly all the bronchial pneumonias began with symptoms of bronchitis.

When intercurrent with measles, scarlet fever or other infectious diseases, the bronchitis often led to fatal consequences. Statistics are not available upon this point, but there seems reason to believe that a great deal of the bronchial pneumonia which followed measles might have been traced to bronchitis, antedating the measles attack.

There is a great amount of difference in the statistics of fatal bronchitis in the different cities of the United States without there being any evident and sufficient explanation of it. There are no reliable statistics of cases. Some persons hold the opinion that the so-called bronchitis deaths are really due to pneumonia and that it is a difference in the custom of reporting rather than a difference in the occurrence, which makes one city record about twenty-five deaths from bronchitis a year while a neighboring city records about seventy.

Bronchitis is reported as a frequent cause of death in civil life in the United States; but it is seriously doubted by many whether death really occurs as the direct result of this disease. Bronchitis may be the beginning, or the most prominent condition, but pneumonia is probably the usual termination. Rarely has bronchitis been reported as a cause of death in the army.

According to the U. S. Census Bureau, bronchitis caused 11,587 deaths in the registration area in 1916, and stood thirteenth in the entire list of diseases arranged in their order of importance as causes of death. The average annual number of deaths in the registration area for the period 1901-1910 was 12,136. The latest statistics covering bronchitis in the army indi-

cate that there were four deaths in the year 1917.\*

Bronchitis is always a common disease in armies, often going by the name of "barrack cough." Little attention is ordinarily paid to it—it is generally looked upon as inevitable. It occurs all the year round with somewhat increased prevalence in the winter. The usual fluctuations are much less pronounced than those of influenza and less than those of pneumonia. Its seriousness as a fore-runner of pneumonia is seldom fully realized.

The prevalence of bronchitis appears to have been due to a number of circumstances. It was not generally dealt with as infectious. Generally it was attributed largely, if not wholly, to the soldier's own fault. Unnecessary exposure, wet feet, lack of attention to proper clothing, carelessness as to the action of the bowels, and sudden cooling after overheating were believed to be the principal contributory causes.

Laboratory findings have not agreed that any particular micro-organism has been to blame. Many organisms commonly found in the nose and throat of healthy persons and sometimes with more or less good evidence associated with disease, have been isolated from bronchitis patients. It is not impossible that, like the common cold and pneumonia, bronchitis may have many microbic causes.

Fortunately it is not indispensable that a causative agent should be discovered in order to arrive at an opinion as to the epidemiological significance of bronchitis. Contributory causes appear to be quite as instrumental in producing some of the respiratory diseases as the infective agents themselves. To prevent these contributory causes from operating would be to get the disease under control.

Whether bronchitis renders a person especially susceptible to another disease is a question of much interest. Obviously it leads to pneumonia and pleurisy and empyema. Like pneumonia, one attack does not protect against others, but on the contrary, predisposes its victims to subsequent attacks. Some people have an attack each winter.

Chronic bronchitis may exist for a life time. Often it almost disappears only to reappear again and again with marked severity. The reappearances are generally supposed to be con-

\* Annual Report of the Surgeon General of the Army, for 1917, page 613.



nected with particular states of the atmosphere and to the conditions which, when a person is not susceptible to bronchitis, might produce a common cold. Cold, damp weather, universally conceded to be an aggravating factor in all throat affections, is unfavorable to bronchitis susceptibles. Cold, damp seasons and cold, damp climates have more than the ordinary amount of bronchitis connected with them.

Dust in excess is harmful. By many it is believed to be a sufficiently common cause of bronchial irritations to account for the excessive prevalence of the bronchitis which sometimes occurs in dusty localities. It would seem that the injury done to the mucous membranes depended as much upon the quality as the quantity of the dust. Sharp, siliceous dusts are the worst, and soft, argillaceous dusts the least harmful. In many of the American camps there was a great deal of dust during the period of mobilization. Efforts were made to prevent it in the barracks by oiling the floors and outside by oiling and watering the roads. These procedures mitigated, but did not overcome, the trouble.

Bronchitis greatly increases the danger to be apprehended from carriers of respiratory infections. A meningitis carrier may be relatively harmless so long as he is in good health, for the germs which he harbors are then fairly well locked up in his nose and throat. But when he experiences an attack of bronchitis he coughs a great deal, and at each paroxysm unconsciously seeks to shoot the germs from his nose and throat into the atmosphere.

Drastic measures have been taken to guard against infection resulting from talking and sneezing; but in so far as these procedures limit the freedom of action of the individual and depend upon scientific exactness in attention to detail, they have not proved effective. The use of the mask may be taken as an illustration. No better protection against infection has been devised and none better is to be desired than the mask. It is capable of protecting the person who wears it from infection from others and is also able to protect others from infection by the wearer. Its efficacy has been abundantly proved. The usefulness of a mask, however, depends not upon its being merely a mask but upon the perfection with which it is constructed and worn. When attention is not given to the details of thickness and closeness and cleanness which are necessary, the mask may become an

actual source of danger. Attention to the details necessary is not possible with the wearers not particularly instructed and supervised. Examination of a large number of masks used in the army and in civil life during the influenza pandemic showed that most of them were worse than useless. It would be quite impracticable to insist that every person who experienced an attack of bronchitis or was in danger of proximity with affected persons should wear a mask continually. Nurses should wear them, as should physicians who are in attendance. Carriers and suspects should be masked when there is any possibility that they may convey infection to others. This does not mean that the masks should be worn continually. Continuous masking is believed by the writer to be impracticable.

To gain control of epidemic bronchitis after it has once gained headway is undoubtedly an extremely difficult undertaking. As with all infections, it is much less difficult to prevent it. In order to prevent bronchitis the conditions which lead to it must be controlled. The early cases must be detected. The cases when found must be isolated from all persons who are in good health. Of great importance is insistence upon the principle that the infectious material should not be carelessly allowed to become scattered but should be disposed of in a suitable and predetermined manner. Promiscuous spitting, coughing and sneezing must be given up. There must be a campaign of education to teach people how to protect themselves and one another.

Bronchitis is essentially a crowd disease, in the sense that it occurs when people are crowded, and shows a preference for persons who are not accustomed to crowds. Countrymen going to cities are especially susceptible. Probably no other disease has so certain a relation to crowding as does bronchitis. There is a general agreement that those who live in the open are relatively free from it and persons who have become accustomed to the conditions of city life are not especially susceptible. It is evidently the transition from the isolated to the crowded conditions of living which is dangerous. This is hardly the place to attempt to explain the relative immunity which city people enjoy toward respiratory infections, but it may be said that the theory of acquired immunity through repeated exposure to small doses of the virus appears, in the light of present evidence, to have much to recommend it.

In the American army much attention was given during the war to the crowding of barracks, and steps were taken to prevent it, but the system of sleeping—sometimes 120 men in a single room—had defects which were too deeply seated to be wholly removed. The barrack room was too large to be managed to good advantage.

In future wars the unit of space for barracks for green troops in a temperate climate should not be larger than sufficient for a squad of eight if the mechanical details for this form of construction can be satisfactorily worked out. The idea of head and foot sleeping and the scheme of suspending papers and other screens between bunks were at best only temporary makeshifts. It is a point worthy of consideration that there was much less sickness in the camps composed of tents than in those which were provided with wooden barracks, in spite of the difficulty of heating and ventilating the tents in cold weather.

It is generally assumed that the respiratory diseases were transmitted chiefly in the sleeping quarters of soldiers. There is little evidence to support this belief. Crowding is a constant feature of the soldier's life outside of his barracks as well as in them. The places which he frequents for pleasure and instruction and to make small purchases are all crowded. His mess hall and latrine afford facilities for the transmission of respiratory infections. On his days and nights off he usually visits some city or town where he is crowded as closely as he is in the camp or cantonment where he belongs. The gathering of people together is a natural and pleasantly exciting experience, when the crowding is not compulsory, and it is not to be denied that most soldiers enjoy it.

The extent of the crowding outside of the barracks and the length of time during which this crowding occurs will be described here on account of the light which it throws on the opportunities for infection which the crowding habits of the men permit. The following data, derived from a careful study of a camp, are believed to be representative.

There were four moving picture theatres with a total seating capacity of 9,389. These theatres were open from 4 o'clock in the afternoon to 9 o'clock at night. There were four performances daily. The average attendance was 3,114, which is about one-third of the capacity, but this by no means gives a correct idea of the close

bodily association of those who composed the audience. The intensity of the crowding was nearly the same, regardless of the number of persons present, for the seats were taken in a compact mass, the audience not being scattered evenly through the hall. On entering and leaving the building, the personal contact was very close. The seats were 17 inches wide and there was an allowance of 28 inches per person, center to center. Briefly, about 3,110 men spent one and a half hours per day in the moving picture houses, sitting with mouths 17 inches apart in one direction and 28 inches apart in the other.

The post exchanges and Y.M.C.A. buildings, especially the latter, afforded no less remarkable examples of crowding than the moving picture establishments. Occasionally an auditorium such as the Y.M.C.A. building became densely packed for a long period of time, as for example, when an organization was detailed to attend a lecture. On such occasions each man might have but 3.12 square feet of floor space and 38.76 cubic feet of air space. In the barracks the allowance was 45 square feet and 500 cubic feet, respectively.

Dense crowding occurs in civil life, but with a certain marked difference. So large a part of the population of a given place is not so frequently crowded and the crowding is not so long continued on a given occasion. The soldier knows no greater crowding than that which occurs in street cars and subway trains; clothed human bodies cannot be packed more closely. But only one, or a few, members of a family are so exposed; the rest escape.

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### Book Reviews.

*Diseases of the Skin.* By JAMES H. SEQUEIRA, M. D. Philadelphia: P. Blakiston's Son & Co. 1919.

The third edition of Sequeira's work has appeared. The second edition was exhausted soon after it was published. The author refers to the limited amount of research work accomplished of late, owing to abnormal conditions, but finds a good deal to add, especially with regard to parasitic affections. Although new plates and figures in the text have been added, the book has not been increased in size. The new illustrations maintain the high standard of excellence of the old ones.

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## THE PANDEMIC OF 1918.

"THE LESSONS of the Pandemic" is the subject of a recent article in *Science* by Major George A. Soper, Sanitary Corps, U. S. A., which is of special interest in connection with the paper on bronchitis by the same author in this issue of the JOURNAL.

In expressing his views upon this important subject, the author says the whole world stood aghast at the mystery which surrounded the influenza pandemic in 1918 and that the measures which were taken for its control were really only based on theory. Because, at the beginning of its onset, it stimulated the common cold, it was impossible to adopt means of immediate isolation.

Major Soper believes that three difficulties stand in the way of prevention. First, public indifference. People who suffer from common colds do not realize the dangerous phases which may develop from such infections, and often not until very alarming symptoms have

appeared does the patient consent to submit himself to definite treatment. Before this happens, however, he had very likely infected other persons.

Second, influenza is a specific infection classed, like diphtheria, measles, and scarlet fever, with respiratory diseases; but unlike the latter, the waste products of influenza cannot be adequately dealt with. Unconsciously the waste products of influenza are projected from the nose and throat through the air, and consequently the entire environment of the affected person becomes contaminated. But, because isolation is not feasible in every case where early symptoms are not merely those of a common cold, preventive measures are difficult to carry out.

Third, the period of incubation is so varied, sometimes being as short as one or two days, that it is possible to transmit the disease from one person to another before the patient himself realizes that he has been attacked. There must also be taken into consideration the likelihood of healthy persons harboring the germ. Although these obstacles may appear at first almost insurmountable, we have only to remember the progress which has been made in the control of typhoid fever, yellow fever, etc., and to look forward to the same successful combating of influenza epidemics. Public health officers, skilled bacteriologists, pathologists, clinicians who have had ideal opportunities for studying the disease, all are now at work upon their reports of the recent epidemic. And when these have been gathered together, when statistics as to age, sex, race, conditions, etc., have been tabulated and studied, much will have been accomplished toward viewing the situation from a wider perspective. Close range attack and its terrible suddenness have hampered the most careful attempt at study. Now, when it can be viewed from so many angles, a good deal may be expected in clearing up the mystery. If influenza is not entirely absent during the intervals of epidemic, so much the better for observation. Opinion is divided on this subject. Some argue that the recent pandemic was the result of a particularly virulent type of the common infection; and in almost every country the consensus of opinion is that isolation, though difficult, is the only way to exclude the disease from a community.

Many people are prone to believe that only

an atmospheric or terrestrial condition can produce a phenomenon of such world-wide prevalence. In 1889-90 it was believed by some that world conditions were responsible for that particular outbreak, and today there are people who think that it was due to the weather conditions during the winter of 1917-18. Others believe that the war was responsible, and still others say that it was spontaneously developed in many places at the same time. All these suppositions, unfortunately, seldom stand the test of scientific analysis. It is now believed, with the weight of evidence in agreement, that the immediate cause of the pandemic of 1918 was an infective virus which passed from person to person until it had spread over the entire world. The disease travelled at about the same rate at which people travel from point to point. So far the virus is believed to be an hypothetical one, and its mode of entrance, its leave-taking and period of transmission are still in question. Whether or not the disease is always with us, nobody can answer, but it would seem that it is not unlikely, for a virus which had existed somewhere among persons who had become immune to it could be introduced among strangers to it and attain enormous proportions.

However this may be, the pandemic has shown how quickly infections can travel, how easily they can gain entrance to the nose and mouth, and to what a high degree preventive measures should be carried out. Sir Arthur Newsholme, Medical Officer of Health to the Local Government Board of England, said that until the common respiratory infections are studied and controlled, it will be impossible to understand and manage influenza.

Nobody can answer the question, "Will there be another visitation?" Influenza commonly sweeps in more than one wave. If it is probable that this will be the case, then the great lesson of the pandemic has been to call attention to the prevalence of respiratory disease in ordinary times, the indifference with which we view them, and our inability to cope with them. They must be controlled by administrative procedures and by exercise of appropriate measures of self-protection. Much has been written on the subject of general health and protection, but Major Soper believes that the most essential things to remember are embodied in the following rules prepared last au-

turn and recommended by the Surgeon General of the Army, published by the order of the Secretary of War, to be given all possible publicity:

1. Avoid needless crowding—influenza is a crowd disease.
2. Smother your coughs and sneezes—others do not want germs which you throw away.
3. Your nose, not your mouth, was made to breathe through—get the habit.
4. Remember the three C's—a clean mouth, clean skin, and clean clothes.
5. Try to keep cool when you walk and warm when you ride and sleep.
6. Open your windows—always at home at night; at the office when practicable.
7. Food will win the war if you give it a chance—help by choosing and chewing your food well.
8. Your fate may be in your own hands—wash your hands before eating.
9. Don't let the waste products of digestion accumulate—drink a glass or two of water on getting up.
10. Don't use a napkin, towel, spoon, fork, glass, or cup which has been used by another person and not washed.
11. Avoid tight clothes, tight shoes, tight gloves—seek to make nature your ally, not your prisoner.
12. When the air is pure breathe all of it you can—breathe deeply.

## PHYSICAL EXAMINATION OF THE FIRST MILLION DRAFT RECRUITS.

THE initial selective draft for 1917 presented an opportunity to study the physical constitution of the people of the United States. There were measured and examined physically about 2,510,000 men, of whom 730,000, or 29.1 per cent., were rejected because of physical disability. Between December 15, 1917, and September 11, 1918, over three million men were examined. After July, 1917, recruits were accepted in three groups: the first selected for general military service; the second, for limited or special service; and the third, for service after remediable treatment.

The percentage of rejections at mobilization camps shows a great fluctuation at the different camps; but in spite of the variation in standards of the physical examining boards, it is pos-

sible to show that the incidence of particular defects and diseases in different sections of the country is very different. It has been estimated from fairly complete returns from local boards, mobilization camps, and disability discharges, that during the first four months of mobilization about one-third of the men who were physically examined were rejected on physical grounds, and that during the following eight months about one-fourth of such men were rejected. The Provost Marshal's figures indicate that about twenty-two per cent. of the rejections were caused by some mechanical defect in the organism; fifteen per cent. were rejected because of imperfections of the sense organs, and about thirteen per cent. for defects in the cardio-vascular system. About twelve per cent. were rejected on account of nervous and mental troubles, in part due to abnormal thyroid secretions. Approximately ten per cent. were rejected on account of tuberculosis and severe cases of venereal diseases. About  $8\frac{1}{2}$  per cent. were rejected because of developmental defects in physique, about 6 per cent. for trouble in skin and teeth, and about  $13\frac{1}{2}$  per cent. for other defects. The rejections at camps following the physical examination of the first million men reveal a different order,—imperfection in the sense organs being the principal defects, mechanical defects taking second place, followed by circulatory defects and diseases, tuberculosis and venereal diseases, skin and teeth, nervous and mental troubles, and developmental defects.

In this report, Bulletin No. 11, a comparison is made between the defects found among men coming from rural and from urban communities, and in detail from four large cities,—New York, Chicago, Philadelphia, and Boston.

#### RABELAIS, A LITERARY PHYSICIAN.

It is seldom that the medical profession can claim among its ranks a physician whose literary attainments have equalled those of Rabelais, the monk. In a recent issue of the *New York Medical Journal* there has appeared an interesting account of the life, interests, and achievement of this man.

Little is known about the birth, parentage, and early education of François Rabelais, ex-

cept that he was born in Chinon, in Touraine, about the year 1490. He was probably brought up in a monastery, becoming first a Franciscan monk, then a Benedictine monk, and later, a secular priest.

It was probably about the year 1530 that Rabelais began the study of medicine at the University of Montpellier. In 1532, he moved to Lyons. At about this time, he published *Gargantua and Pantagruel*. During his stay at Lyons, Rabelais was engaged to take charge of the hospital patients at a salary of forty pounds *tournois* a year. He merits the distinction of being the first hospital intern whose name has been handed down to posterity. He became physician to the embassy at Rome in 1534, and in 1539 entered the service of Guillaume du Bellay Langey. During 1546 and part of the following year, he became town physician at Metz in Lorraine. In 1547, he went to Rome, where it is thought that he died in 1553.

The writings of François Rabelais reflect his interest in the medical profession, and give evidence of medical erudition far in advance of his time. His works display a wide knowledge of anatomy and of many diseases. His writings are not well known in English speaking countries. *Gargantua and Pantagruel*, his most famous work, is archaic in language and displays the unbridled license characteristic of the sixteenth century. Perhaps the only literary physician who can be compared to Rabelais is Oliver Goldsmith, and his only equal in satirical literature was Swift.

Rabelais excelled in his profession, and far surpassed the physicians of his day in medical lore. He seems to have been successful in his methods of treatment, and gave freely of his knowledge. The profession may justly be proud to claim among its members François Rabelais, perhaps the greatest of literary physicians.

#### MEDICAL NOTES.

GRAND CENTRAL PALACE. On September 30, 1919, the Grand Central Palace, New York, which has been used as an army base hospital since last September, will be returned to its owners.

FORDHAM MEDICAL SCHOOL.—The medical school at Fordham University, New York, has been closed, because of lack of funds to carry on the work of the institution.

HONOR FOR AMERICAN NURSES.—On June 5, King Alexander of Greece conferred the Medal of Military Merit on nine American Red Cross nurses for their work in fighting the typhus epidemic in Macedonia.

INFLUENZA IN BATABANOS.—It has been reported that in May, 1917, over one year before the recent epidemic of influenza, there was an epidemic of disease in Batábanos which was at the time believed to be dengue. A few cases of bronchopneumonia and of meningitis, which occurred at the same time, were not associated with the epidemic. In August, 1918, there developed a similar epidemic, which was called by some dengue and by others grippé. This lasted until November and attacked in a mild form two thousand out of six thousand inhabitants. During the month of November, the disease became malignant, often causing a robust man to be killed within a few hours by pulmonary edema and cardiac collapse. There appears to have been a similarity between the two epidemics; both appeared in the summer months, and the absence of rash seems to exclude dengue. It is possible that mild episodes like those in Batábanos may in reality be true influenza in a latent form.

VALUE OF BACTERIAL VACCINES.—An article in a recent Public Health Report describes the common sources of error in determining the prophylactic or curative value of bacterial vaccines against infection. It is stated that the evidence advanced in support of certain preparations has been very striking, but that the data on which it is based is sometimes of little value. It is pointed out that there are three chief sources of error. In the first place, statistics relating to the use of vaccine in an institution, or in a group outside an institution, sometimes appear to be convincing, but lose their significance when it is learned upon closer examination that a large proportion of the personnel involved has developed the disease before the vaccinations had been done. A second cause of error is to vaccinate all persons in a group, and to interpret the failure of the disease to appear or to

spread as evidence of protection; for other unvaccinated groups may have shown a similar immunity. A third mistake is in drawing conclusions from too meagre data. Probably the only way to secure acceptable evidence of the value of bacterial vaccine is by the vaccination of only a certain number of the individuals in a large group, in which the age, sex, and conditions of exposure are similar.

REPRESENTATIVE OF NURSING PROFESSION AT CANNES CONFERENCE.—Miss Julia C. Stimson, chief nurse of the American Expeditionary Forces in France and formerly head of the American Red Cross Nursing Staff in Europe, is the one graduate nurse from the United States selected to serve as a delegate to the International Red Cross Conference in France. Recently, Washington University, St. Louis, conferred the degree of Master of Arts upon her in recognition of her services overseas.

Miss Stimson is the daughter of the Rev. and Mrs. Henry A. Stimson of New York. She was graduated from Vassar in 1901, intending at the time to study medicine. Later she decided to take up nursing and in 1904 entered the New York Hospital Training School for Nurses. A few years after being graduated she became superintendent of the Harlem Hospital, New York City, which post she left to take charge of the nursing and social service at Washington University, St. Louis. Later she acted as superintendent of nurses and head of the training school for nurses at Barnes Hospital, Washington, D. C., which position she held until she joined an American hospital unit and sailed for Europe in May, 1917. She served in Great Britain ten months and was transferred to the service of the American Red Cross in April, 1918.

DECORATION OF AMERICAN NURSE BY THE FRENCH GOVERNMENT.—Miss Margaret Mahoney of New York has been awarded the highest honor of the French Red Cross and has been decorated with the *Médaille de Reconnaissance de France* in recognition of her services to the French wounded. Miss Mahoney is an American girl of Irish birth. At the outbreak of the war she was living in Paris, and joined the French Red Cross, with which she served as a nurse until America entered the war. Later she joined the American Red Cross.

**EMOTION AS AN ELEMENT IN MILITARY UNFITNESS.**—In an address before the American Psychopathological Association at Atlantic City on June 18, 1919, Dr. Tom A. Williams is reported to have expressed the belief that emotional strain is not generally an important factor of nervous break-down in war. He cited statistics which showed that of 1,240 cases of functional disorder, only 70 passed as emotional, and that even when asthenia was included in the statistics, only 13 per cent. of the patients could be included. He believes that the great proportion of the cases are hysterical rather than emotional, and that the patient's condition can be readily changed by appropriate psychological management.

**HOME SERVICE DEPARTMENT OF THE RED CROSS.**—At a conference held in Atlantic City from May 26 to June 5, plans were outlined for the future activity of the Department of Home Service of the American Red Cross. When its workers are no longer needed among the families of soldiers and sailors, it is believed that there will still be a field of usefulness in general family social work in places where this service is not provided by other agencies. The information service, which has proved to be helpful during the war, may be continued to advantage; its basis would be a handbook including a summary of the laws which social workers should know, a social service directory, and a section dealing with such matters as immigration and naturalization laws. A third field of usefulness for the Home Service will be in meeting the needs of communities in questions of community health and sanitation.

**AMERICAN MEDICAL ASSOCIATION.**—The following report of the publications of the American Medical Association has been published in a recent issue of *Science*:

The increase in subscriptions of the *Journal* of the association for the year 1918 was small—229 all told—but this, under the circumstances, must be regarded as satisfactory. The weekly circulation during the first four months of the current year was greater than that in any previous four months, averaging over 70,000. The foreign circulation was also steadily increasing. The advertising standard of the *Journal* had been maintained, or, if anything, censorship had been more rigid. The wisdom of establishing the Coöperative Medical Advertising Bureau became more evident each year. This bureau had demonstrated that it was possible to

secure for the state journals a fair amount of advertising of which the profession need not be ashamed. The bureau began this year with twenty-six state journals; the only state journal not represented was that of Illinois. The *Archives of Internal Medicine* had been conducted at a loss, while the *American Journal of Diseases of Children* showed a small profit. The Spanish edition of the *Journal* was now issued on the first and fifteenth of each month and contained practically all the scientific material in the regular edition; but matter that was ephemeral or of local interest was not included. The subscriptions were coming in rapidly and at present it had a circulation of 1,400. In response to a petition signed by a large number of leading neurologists and psychiatrists, the *Archives of Neurology and Psychiatry* had been established. It was published on the same terms as the *Archives of Internal Medicine*. This journal might already be regarded as a success. It was of the highest order, a credit to American medicine, and to the association. At a meeting held recently in Atlantic City, it was emphasized that the association was not publishing these journals for financial gain; its sole object was to advance scientific medicine and to benefit the American medical profession. The board of trustees was of the opinion that the association should publish more of these special journals if, and when, there was a call for them. Both the American Medical Directory and the quarterly Cumulative Medical Index showed the effects of the war and had been published at a considerable loss. The house of delegates approved a motion providing that the publication of a *Journal of Surgery* be considered and also the publication of a *Journal of Medicine* for lay readers, if the house found such a procedure advisable.

**NATIONAL TUBERCULOSIS ASSOCIATION.**—At the annual meeting of the National Tuberculosis Association held at Atlantic City on June 14, the necessity for adequate tuberculosis work was emphasized. Dr. David R. Lyman, president of the Association, is reported to have remarked that one of the greatest victories of the war was the fact that the government and the people of the United States had been awakened to the dangers of chronic as well as acute infectious diseases. He expressed the belief that a division of tuberculosis would soon be organized as a part of the United States Public Health Service, as a result of the information revealed by draft board records.

Dr. Charles J. Hatfield is reported, pointed out that although tuberculosis causes 150,000 deaths annually in this country, the burden of the fight against the disease is being borne by

voluntary associations, whose work is handicapped by inadequate laws.

Dr. James H. Pershing, in commenting on indigent migratory consumptives, is reported to have attributed the spread of tuberculosis to patients who travel from one place to another in search of a climate which will cure them.

Government officials and health authorities from every state in the Union discussed plans for a new nation-wide health campaign against tuberculosis.

**RED CROSS APPOINTMENTS.**—Colonel Richard P. Strong, of the United States Army Medical Corps, and professor of tropical medicine at Harvard University, has been appointed acting director of the bureau of hygiene and public health of the League of Red Cross Societies. Colonel Strong has risked his life many times in South America in China, and in the Philippines and the near East in fighting tropical diseases. Two tasks which he has accomplished during the past few years are of great importance: his campaign in Serbia during 1915 against typhus, and his research investigations in trench fever.

The Red Cross has appointed Mr. W. Frank Persons of New York, formerly director-general of the department of civilian relief of the American Red Cross, director of development of the league and acting assistant to Lieutenant-General David Henderson, director-general of the league. He will undertake to mobilize the resources of the league and to assemble an organization to supervise the campaign against typhus and other relief work in eastern Europe.

**AMERICAN MEDICAL ASSOCIATION.**—At the meeting of the American Medical Association, held recently in Atlantic City, the following officers were elected for the coming year:

President, Surgeon-General W. C. Braisted; First Vice-President, D. L. Edsall, Boston; Second Vice-President, Emory Marvel, Atlantic City; Third Vice-President, Eugene S. Talbot, Chicago; Fourth Vice-President, George H. Kress, Los Angeles; Secretary, Alexander R. Craig, Chicago; Treasurer, William Allen Pusey, Chicago; Speaker of House of Delegates, Hubert Work, Pueblo, Colo.; Vice-Speaker, Dwight H. Murray, Syracuse, N. Y.; Trustees, Archibald Bowling, Shreveport, La.; A. R. Mitchell, Lincoln, Neb.; D. C. Brown, Danbury,

Conn.; Judicial Council, Ira C. Chase, Fort Worth, Texas; Council on Health and Public Instruction, Haven Emerson, New York City; Council on Medical Education, Arthur D. Bevan, Chicago; Council on Scientific Assembly, J. B. Blake, Boston.

The meeting of the Association next year will be held at New Orleans.

**MEDICAL VETERANS OF THE WORLD WAR.**—At a recent meeting of the American Medical Association, there was organized an association to be called the American Medical Veterans of the World War. Victor C. Vaughan, dean of the University of Michigan, was elected the first president.

**BRITISH HONOR FOR MAJOR-GENERAL IRELAND.**—The British Government has conferred the Cross of Companion of the Bath upon Major-General Ireland, in recognition of his services as chief surgeon of the American Expeditionary Forces and as Surgeon-General of the American Army.

**APPOINTMENT OF DR. LEVERETT D. BRISTOL.**—The University of Tennessee College of Medicine at Memphis has elected Dr. Leverett D. Bristol dean and professor of bacteriology and public health.

**APPOINTMENT OF PROFESSOR C. R. MARSHALL.**—Professor C. R. Marshall, professor of materia medica and therapeutics in the University of St. Andrews, has been appointed Regius professor of materia medica in the University of Aberdeen.

**DEPARTMENT OF INDUSTRIAL MEDICINE AND PUBLIC HEALTH.**—A department of industrial medicine and public health has been established in the University of Cincinnati. For the support of this department for five years, it is planned that the sum of \$100,000 shall be raised by the citizens' committee on finance. The course will begin in October and will be open to graduates in medicine. Instruction will be given at the college and also at various industrial establishments.

**INTERNATIONAL COÖPERATION IN MEDICINE.**—Plans are being made for organizing headquarters for the American Medical Association in England. There is to be a hospital, a library, lecture theatres, demonstration rooms, and reading rooms.



## BOSTON AND MASSACHUSETTS.

**LAWRENCE GENERAL HOSPITAL.**—Charles H. Tenney of Boston bequeathed to the Lawrence General Hospital, Lawrence, Massachusetts, \$50,000.

**PARKER HILL HOSPITAL.**—Within a short time, the Parker Hill Hospital will be returned to the Order of Elks and patients now there will be transferred to war department hospitals. James R. Nicholson, Past Grand Exalted Ruler of the Elks, in considering the future of the hospital, is reported to have expressed the opinion that the Parker Hill Hospital should be retained for the reconstruction of industrial cripples. The hospital was erected in Boston because of the recognized standing of the orthopedic work being done in this city. It is hoped that with the cooperation of national, state, and city governments, of industrial concerns, insurance companies, and individuals, the work may be continued in the reconstruction of civilian and industrial cripples.

**CONTROL OF VENEREAL DISEASE AT CONCORD REFORMATORY.**—The efforts which have been made to control venereal disease at the Concord Reformatory have been reported in a recent issue of the "Commonwealth." In 1911, the first doses of salvarsan were given intramuscularly in the reformatory hospital. Since that time, every case of syphilis has been treated with the combined mercurial and salvarsan treatment. Various steps of improved technique have been introduced at the reformatory clinic: the intramuscular administration was succeeded by vein dissection, then by venipuncture with a bent needle, and later by an improved straight needle held in forceps. No severe reaction and no fatalities have occurred.

The incidence of syphilis during the past year was reported as fourteen per cent. of arrivals. Approximately one-half of the cases are not cured, but a primary case is seldom encountered. Sixty persons, out of a total of seven hundred, have been suffering from gonorrhoea at this institution.

**MASSACHUSETTS GENERAL HOSPITAL.**—The one-hundred and fiftieth annual report, Section A, of the trustees of the Massachusetts General Hospital describes the work of the General Hospital in Boston, the McLean Hospital, and the Convalescent Hospital in Waverley for the year

1918. At the General Hospital, the term of service of surgical house pupils was reduced from fourteen to twelve months; but after the signing of the armistice, steps were taken to return to the twenty-one months' service of medical house pupils. In January, an outbreak of scarlet fever in the hospital became so serious that for nearly a month only emergency patients were admitted. The service of the hospital has been increased by the sixteen-bed ward into which the old Treadwell Library has been converted. This room has been used by sailors transferred from the Naval Hospital. During the epidemic of influenza, general surgical patients, except emergency cases, were not admitted. Over eight hundred cases of influenza were cared for. In 1918, a total number of 6,702 patients were admitted to the wards, at an average daily cost of \$4.37.

The Out-Patient Department cared for 25,441 cases. X-ray cases in this department numbered 9,408. The Nursing Department has done its utmost to answer the call to train more nurses, and has kept its classes as large as facilities permitted. The Social Service Department and volunteer workers have rendered notable service throughout the year. There were admitted to Phillips House 221 medical cases, 796 surgical, and 80 obstetrical cases in 1918.

The Convalescent Hospital, which has been closed for some time for the sake of economy, was opened on October 3, to provide care for McLean Hospital doctors and nurses suffering from influenza. On October 11, the lower floor was opened for convalescent cases from the General Hospital. The Hospital was again closed on November 5.

The McLean Hospital reports the admission of 137 patients in 1918: the whole number under treatment amounted to 352, with a daily average of 208 patients. The business administration of the McLean Hospital has been separated from that of the Massachusetts General Hospital. The report of the McLean Hospital contains statistical tables concerning the mental conditions of patients and causes of death, and gives an account, also, of the war services rendered by the doctors and nurses of the hospital.

**MASSACHUSETTS HOSPITAL FOR CONSUMPTIVES.**—The twelfth annual report of the Massachusetts Hospital for Consumptives records the work of the North Reading, Lakeville, Westfield, and Rutland State Sanatoria during the

past year. These institutions have provided for a total of 403,375 days of treatment for 2,455 patients. The Barnstable County Sanatorium, situated at Pocasset, was opened in August, 1918, and other similar institutions will be completed as rapidly as possible. The work of the tuberculosis dispensaries which have been established throughout the State has proved to be valuable in making prompt diagnoses of early cases and also in the care of patients discharged from the State institutions. In Massachusetts, statistics show a slight increase in the incidence of tuberculosis in the civilian population during the past year.

The North Reading State Sanatorium has cared for an average number of 196.39 patients during the year; the Lakeville State Sanatorium, 260.35; the Westfield State Sanatorium, 269.09; and the Rutland State Sanatorium, 347.83.

### Miscellany.

#### MEMORIAL RESOLUTIONS FOR DR. SARAH A. BOND FRASIER.

THE Medical Staff of the New England Hospital for Women and Children desire to express their profound regret in the death of Dr. Sarah A. Bond Frasier. Her long and faithful service on the hospital staff, her genial personality, her inspiring coöperation in the conduct of the hospital will make her loss most deeply felt. Be it therefore

Resolved, that we convey to the family our sympathy, appreciation, and sorrow, and express to the Board of Directors our sense of irreparable loss. Be it also

Resolved, that these resolutions be published in the BOSTON MEDICAL AND SURGICAL JOURNAL.

### Correspondence.

#### ARSPHENAMINE AND VASO-DILATORS—A FURTHER EXPLANATION.

Boston, July 5, 1919.

Mr. Editor:—

Since the publication, in the JOURNAL, of my article on the above subject, some of my professional friends have asked me some questions pertaining to it which perhaps indicate lack of lucidity on my part in my original treatment of the subject. Hence this short appendix.

A young physician, of high scientific attainments and connected with one of our leading medical schools, wrote down the chemical formula of arspenamine and added to it the formula of sodium nitrite ( $\text{Na No}$ ) and wanted to know if there would be any chemical or pharmaceutical incompatibility in the re-

sultant combination. I told him that Nature's natural laboratory (the human body) did not always work in accordance with our laboratory experiments. However, in order to avoid that remote contingency, we can dissolve the proper dose (one or more grains) of sodium nitrite in enough of distilled water, and administer it 15 or 30 minutes before giving the proper dose of arspenamine. Thus the two salts will not come into physical contact in the stomach, while sodium nitrite, previously entering the blood current, will dilate the arterioles and thus facilitate wide distribution and absorption of the specific drug. This is perfectly feasible if once we adopt the sodium salt as a pilot synergist of arspenamine.

The second question raised is concerning the physical condition (whether in powder or in solution) of arspenamine to be given by the mouth. Now it is intravenously administered in solution once a week, on an average. Three 4½ decigrammes (5 or 7½ grains respectively) are dissolved in 250 c. c. of distilled water and injected at one sitting. Now, why cannot we dissolve the proper dose of the drug in 250 c. c. of distilled water, put it in an eight-ounce glass-stoppered bottle, and tell the patient to take one tablespoonful, t. i. d., P. C. or A. C., as the case may be determined upon by experience. *A priori*, it ought to be taken after meals, along the general principles of the exhibition of arsenic preparations, and about an hour and a half after eating, in order to make its sojourn in the stomach as short as possible. The sodium nitrite pilot synergist can be taken before meals if so preferred. The patient will have on hand two bottles of medicine—one of sodium nitrite and the other of arspenamine. When he uses them up, he will come back to his physician for a fresh supply. Each practitioner ought to prepare his own solutions of these two salts under the strictest conditions of pharmaceutical cleanliness. I have no doubt as to the satisfaction this procedure will give both to the doctor and to his patient, avoiding laceration of the arms and occasional dangerous syncope. As sodium nitrite is soluble at the rate of one part in five parts of water, we can dissolve one ounce of it in five ounces of water and tell the patient to take five drops of it 30 minutes before he takes the parent medicine, or before each meal, as the case may be.

DR. H. S. JELMAN.

#### THE POLITICAL DUTY OF PHYSICIANS.

Somerville, Mass., June 27, 1919.

Mr. Editor:—

I agree fully with Dr. Samuel B. Woodward in his article in the JOURNAL of June 26. Every registered voter, physicians included, should attend all primaries and then all elections, as their duty to the country. Physicians should not shirk these duties. They should use all their influence for the nomination and election of honest, capable men. The people should closely watch all legislation, state and national. While legislators and executives are the power *pro tem.*, the people are the source of power and should see that wire-pulling rings, mercenary tricksters, together with retro-active and unconstitutional legislation, are excluded from all legislative bodies. Members of legislative bodies are there to carry out the will of their constituents and not to encroach upon the constitutional rights of the people, not to break government contracts with the people, nor to enact retro-active legislation for salary grabbing or other unlawful purposes. The American Medical Association would do well to carry the last retro-active, contract-breaking narcotic act to the United States Supreme Court to test its constitutionality. What kind of a war could the United States carry on without the aid and coöperation of the medical profession? And it should insist upon and protect its rights against all schemers who are attempting to encroach upon them. If we have biennial elections we should have the initiative, referendum, and recall, lest some forget the wishes of their constituents, before their terms expire.

EDWIN A. SANBORN, M.D.

# The Boston Medical and Surgical Journal

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## The Massachusetts Medical Society.

### THE SHATTUCK LECTURE.\*

#### ENERGY REQUIREMENTS OF CHILDREN FROM BIRTH TO PUBERTY.

By FRANCIS G. BENEDICT, BOSTON.

[From the Nutrition Laboratory of the Carnegie Institution of Washington, Boston, Massachusetts.]

Of the innumerable measures for conservation instituted as a result of war, it is probable that none will be more effectively and universally retained than those conserving child life. The recent International Red Cross Congress at Cannes, participated in by my colleague, Dr. Fritz B. Talbot, is but an expression of the intense interest shown by all economists and physicians, not only in the retention of existing agencies for the betterment of child life, but in the elaboration of further plans to this end.

With no desire to minimize the enormous significance of prenatal care, the importance of breast feeding, and of the best hygienic conditions both for mother and child before and after birth, perhaps the most important factor in the life of the child after it has been weaned is the quality and quantity of its food. While it has long been clinically established that milk is a necessity in the diet of the child, it is only in recent years that modern investigators have

scientifically explained this fact by showing that certain food accessories, popularly termed "vitamines," are best served to the growing child in the form of milk. So far as the quantity of food is concerned, we now know that appreciable amounts of protein, fat, and carbohydrate are necessary, but for our present consideration we can lay more emphasis upon the total caloric content of the food ingested.

Computations and estimates of the heat value of the food intake made with individual children, while of considerable significance and of great help during the earliest years of life, are usually so scattered and unfortunately so individualistic as to prevent any but the grossest generalization. For an intelligent understanding of the laws governing the vital activity of children, fundamental observations of physiological factors, determined in a large number of instances in special laboratories, are essential.

Food is needed for two main purposes, first to supply the energy requirements for maintenance or, in common commercial parlance, the "overhead charges" of running the organism or little machine, and second, to provide the very substantial additions thereto needed for the large amount of muscular activity of the growing child. Physiologists have long recognized that the maintenance cost is of prime importance in a comparison of the normal values for energy requirements for individuals of all ages. The

\* Read before the Massachusetts Medical Society, at Boston, June 3, 1919.

measurement of the heat produced by a child or adult as a result of oxidation and the transformation of energy has now become a matter of laboratory technique. The details of such measurement have long been satisfactorily developed and we now await only the amplification of observations on individuals for the making of intelligent group averages.

The Nutrition Laboratory has been occupied for the past decade or more in the study of the heat production of humans from birth to old age. For a number of practical reasons the largest number of subjects studied have been of the so-called college student age, since such students were available as both volunteer and paid subjects. A number of years ago it was proposed that a study be made of the energy requirements of normal children. Dr. Fritz B. Talbot volunteering to coöperate in such an investigation. Thanks to the officials at the Massachusetts General Hospital, particularly Dr. F. H. Washburn, opportunity was given for the establishment there of a respiration laboratory, thus making possible a study of the heat production of children under two years of age.<sup>1</sup> As time went on, it was seen that we could not rely upon the ordinary hospital population for distinctly normal material, as presumably the last place to which a normal healthy child would go is a hospital. Arrangements were made to obtain a large number of new-born infants from the Boston Lying-In Hospital and a sufficient number of these infants were studied to establish thoroughly the basal metabolism or heat production of children immediately after birth and up to 8 days of age.<sup>2</sup> To extend these fundamental observations by studying children 8 days and older has been the object of our coöperative investigations for a number of years past and we now have data covering the period from birth to puberty with both sexes.

The method of measuring the heat production of the child deserves more than passing notice. To make the presentation of our results this evening more intelligible, may I refresh your memory on a few of the fundamental facts pertaining to the measurement of heat production.

When material is oxidized in the body, carbon dioxide is given off, oxygen is consumed, and heat is produced. These processes go on irrespective of whether food is taken or not, for the fasting organism during the first few

hours of fasting shows no appreciable diminution in heat production. The direct measurement by a calorimeter of the heat given off by an individual represents, perhaps, one of the most complicated processes in the physiological laboratory. Fortunately, by means of standard, well-established figures, it is possible to compute with great accuracy the amount of heat produced if one knows the amount of carbon dioxide produced and the amount of oxygen consumed; consequently, for a large portion of modern experimental work upon the metabolism of children, only the accurate measurement of the carbon dioxide produced and oxygen consumed is essential.

The processes of combustion in the body are augmented principally by two factors. The ingestion of food *per se* calls for an increase in heat output which, with adults, may be very considerable. This increase in heat production has had many explanations but we believe it to be due to the fact that the products of digestion, probably of an acid nature, have a stimulating effect upon the cells, thus causing greater cellular activity. Such increase in heat production may for a short time rise to 50 per cent. of the normal resting metabolism without food in the stomach. Of far greater influence upon the heat production, however, is muscular activity in any form. This may, in the case of hard-working adults, amount to 1,000 per cent., or 10 times the normal heat production.

For heat measurements to be comparable, not only with adults but with infants and older children, it was soon found that they must be made as nearly as possible under comparable conditions, *i.e.*, with complete muscular repose and, if practicable, without food in the stomach. Under these conditions the heat production measured is termed the *basal* metabolism and is quite synonymous with the overhead charges of the commercial world, *i.e.*, the cost in calories for running a machine when no external work is performed. It is not necessary to have productive work performed in order to increase the heat production. Thus crying increases the metabolism of a child very greatly over that of a perfectly quiet infant. One can easily see that for physiological control it would be utterly impossible to compare the metabolism of a restless, crying, normal infant with that of a weak, sick, emaciated child, remaining perfectly quiet.

In the last analysis, measurements of the normal metabolism are most useful to the clinician, at least, for comparative purposes. Such measurements may show whether a specific disease, or the application of therapeutic measures changes or modifies in any way the vital activities of the child as expressed in the sum total of its heat output, since the total heat production may be looked upon as the resultant of the activities of the entire organism. Until the probable normal heat production is known, the measurements in disease can have no particular significance or, indeed, real interest. Fortunately Dr. Talbot early recognized the importance of not entering into the more attractive field of the study of abnormal and pathological conditions but realized that the greatest service, not only to physiology and pediatrics but, indeed, to pathology, could best be rendered by a careful survey of the energy requirements or caloric output of perfectly normal children measured under such conditions as to make the results perfectly comparable, other things being equal, with the energy requirements of sick children. I would emphasize again the fact that we have here the rare case of a clinician who has recognized the fact that normal physiological data are, in the long run, of greater value to medicine as a whole than scattered observations of pathological cases could have, most interesting as these latter would be.

Our problem, then, was to measure the minimum heat production, the basal metabolism, the cost of maintenance, the overhead charge expressed in terms of heat, of children from birth to puberty, employing for this purpose the method of indirect calorimetry, *i.e.*, the computation from the carbon-dioxide production and oxygen consumption of the number of calories of heat produced. To insure perfectly comparable conditions, it was necessary for us to demonstrate that we were dealing with children in repose, and consequently our apparatus was so designed as not only to measure directly the carbon dioxide and oxygen but to give a graphic record proving beyond doubt the quietness of our subjects.

To study the gaseous metabolism of infants, *i.e.*, the carbon dioxide produced and the oxygen consumed, we employed a small metal chamber with a quickly removable cover fitting down into a water seal to make it air tight, and connected the chamber with a suitable ventilating device permitting the withdrawal of carbon dioxide from the chamber and the introduction of pure oxygen to take the place of that absorbed by the child. The schematic design of the apparatus is shown in Figure 1, in which it is seen that the pump removes air from the respiration chamber, passes it through an absorbent for water (usually strong sulphuric acid), and afterwards through an absorbent for carbon di-

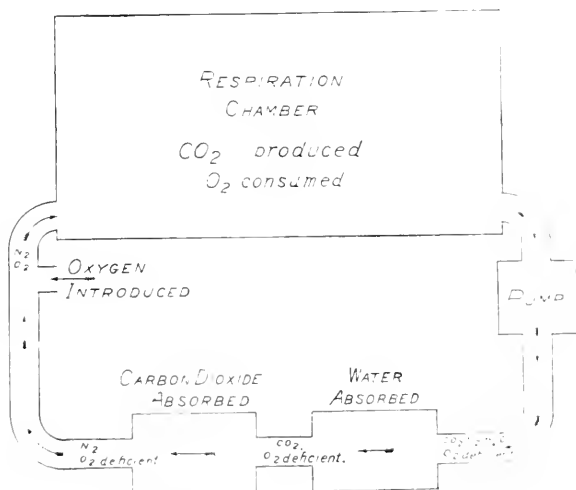


FIG. 1.—Schematic outline of infant respiration apparatus.

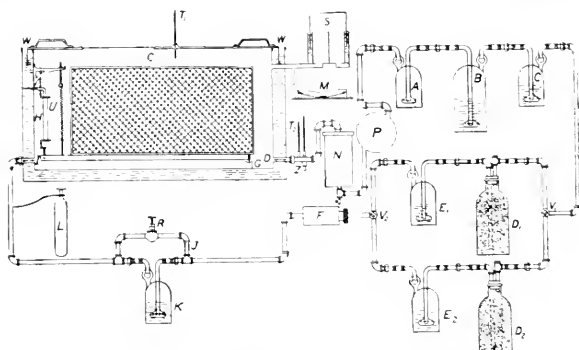


FIG. 2.—Detailed scheme of infant respiration apparatus. C, chamber; W, W, water jacket; O, outgoing air-pipe; Z, psychrometer; N, muffler; P, blower; A, acid trap; B and C, Williams water absorbers; T<sub>1</sub> and T<sub>2</sub>, two-way valves; D<sub>1</sub> and D<sub>2</sub>, carbon-dioxide absorbers; L<sub>1</sub> and L<sub>2</sub>, air dryers; F, sodium bicarbonate can; J, by-pass; R, valve; K, air-moistener; L, oxygen cylinder; I, ingoing air-pipe; S, spirometer; T<sub>1</sub> and T<sub>2</sub>, thermometers; M, manometer; U, spiral spring; H, pneumograph.

oxide (soda lime); the air is then returned to the chamber after pure oxygen has been introduced from a cylinder of the compressed gas. The total amount of carbon dioxide given off by the child can be obtained directly by weighing the absorbing vessels. The amount of oxygen introduced can be directly metered on a good gas meter.

A somewhat more elaborate scheme is given in Figure 2, in which is seen the water-jacketed chamber, the blower, the several water absorbers and soda lime cans in series, the small expansion chamber or spirometer, and particularly the suspension of the inside crib which makes possible a record of the muscular activity. The latter feature is better shown in Figure 3. As the baby is placed in the crib with the head toward the left, one end of the crib rests on the knife-edge bearing, the other is suspended by a spiral spring. Parallel to the spiral spring is a small pneumograph which in turn connects through the walls of the chamber and through a piece of rubber tubing to a tambour and a small pointer which is directly adjusted to write upon the smoked paper on the drum of a kymograph. Any change in the location of the child's centre of gravity alters the tension both of the spring M, and the pneumograph N, thus expanding and contracting the air in N and, in turn, the air in the tambour P, causing the pointer to rise and fall. When the baby is absolutely quiet, the pointer draws a perfectly straight line; when a movement occurs, this is instantly registered by

the pointer. Indeed, it is not uncommon for the slight movements due to respiration, the rise and fall of the chest wall, to be recorded with great regularity on the drum.

A typical picture of a complete kymograph curve is given in Figure 4. It will be seen from this record that for a considerable time after the infant was placed inside the chamber, there was great activity and it was not for approximately 1½ hours that the child became adjusted to the conditions and fell asleep. Thereafter the line is almost unbroken. As we have already stated, metabolism measurements must be made during complete muscular repose, otherwise they have no value for comparative purposes; hence only those observations during the latter part of the period shown by this curve are of value for comparison.

Simultaneously with the records of activity, frequent pulse counts were made by the attendant nurse. The instant response of the pulse-rate to muscular activity is shown in Figure 5, in which the curve for the pulse-rate is compared with the kymograph curve for the activity. The two curves show that when the pulse-rate reached a level, the kymograph line was practically straight. Taking into consideration, therefore, the physiological factors of muscular activity and pulse-rate, we have two admirable checks upon the basal, quiet condition. Accordingly, if we restrict our measurements of the basal metabolism to periods simultaneous with a low pulse-rate and an absence of

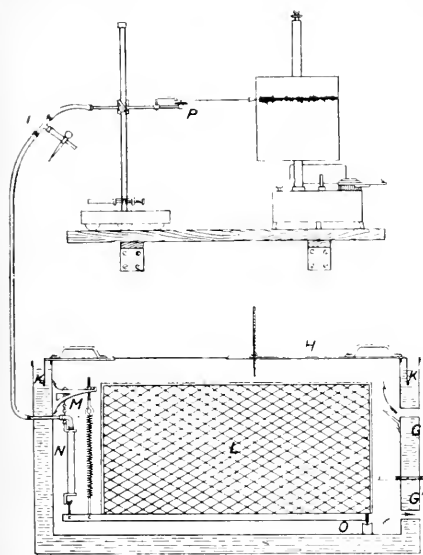


FIG. 3.—Method of obtaining graphic record of muscular activity. *L*, crib; *O*, knife-edge support; *M*, spiral spring; *N*, pneumograph; *P*, tambour; *T*, tee for equalizing tension; *H*, cover of apparatus; *K*, water bath; *G*, ingoing air-pipe; *G'*, outgoing air-pipe.

activity, we are reasonably certain that we are on the proper fundamental basis.

This apparatus for measuring the gaseous metabolism of infants, with the provisions just illustrated for graphically recording the degree of muscular repose, was installed in the Massachusetts General Hospital as shown in Figure 6. It was placed in charge of Miss Alice Johnson of the Nutrition Laboratory staff, whose fidelity and continued interest in the work made the collection of much of our earlier material possible.

This respiration apparatus was used at the Massachusetts General Hospital for about two years; but after the accumulation of data with regard to new-born infants, we sought normal children up to two years of age. Recognizing again that the last place in which normal children could be found was in a hospital, we made arrangements with the Directory for Wet Nurses for such observations. A room was assigned and facilities were provided for studying children from two weeks to two years of age, the children all being the offspring of registered normal wet-nurses and hence an unusually good type of physical normality.

The equipment used is shown in Figure 7, the

apparatus being removed to another place for the purposes of photography. The chamber is shown in the immediate foreground, with the kymograph and pointer, the thermometers through the cover, and the ventilating pipes leading to and from the chamber. The small expansion chamber or spirometer is on the right hand end of the table. The white carbon-dioxide absorbing bottles containing soda lime are on the extreme left, while the motor, blower, and water-absorbing bottles are on the lower shelf. In the rear is the gas meter through which the oxygen is passed and upon which it is measured. The whole operation is one that proceeds with great regularity and simplicity when the technique has once been developed.

It is not, however, with the technique of the observations that we have especially to do, for interest in this is more particularly confined to special laboratories in which such observations are made. Although we have frequently noted that the method of study is not without interest to clinicians visiting the institutions in which we have worked, the results of the observations and the method of computing the values obtained by this technique are of more general interest.

TABLE I.—COMPARISON OF INFANTS' PULSE-RATE AND GASEOUS EXCHANGE DURING PERIODS OF QUIET AND MUSCULAR ACTIVITY.

SUBJECT AND CONDITION	WEIGHT	AV. PULSE RATE PER MINUTE	CARBON DIOXIDE PRODUCED PER HOUR	OXYGEN CONSUMED PER HOUR	HEAT PRODUCED PER HOUR
	kgm.		gms.	gms.	calcs.
Infant (E. N.)	{ asleep	5.41	114	4.81	14.7
	{ awake	5.45	114	5.52	15.6
	{ crying	5.35	136	6.74	19.3
Infant (E. H. S.)	{ asleep	3.15	105	3.20	8.8
	{ awake	—	112	3.68	10.1
	{ restless	—	119	1.58	3.50
Infant (O. C.) 5 hrs. old	3.61	111	2.11	1.98	6.6
Infant (F. H.) 3 hrs. old	4.08	103	2.42	2.04	7.0

By weighing the carbon-dioxide absorber, the amount of carbon dioxide produced in periods of 20 or 30 minutes, depending upon the length of the experimental period, can be exactly determined. By means of a system of valves, the air current can be diverted at the end of the experimental period into a new set of absorbers, and observations made in consecutive periods *ad libitum*. Usually the length of the period is determined solely by the degree of repose of the subject. The oxygen consumption is read directly from the gas meter, the pulse is counted fre-

# BABY MERRITT JAN. 23, 1913.

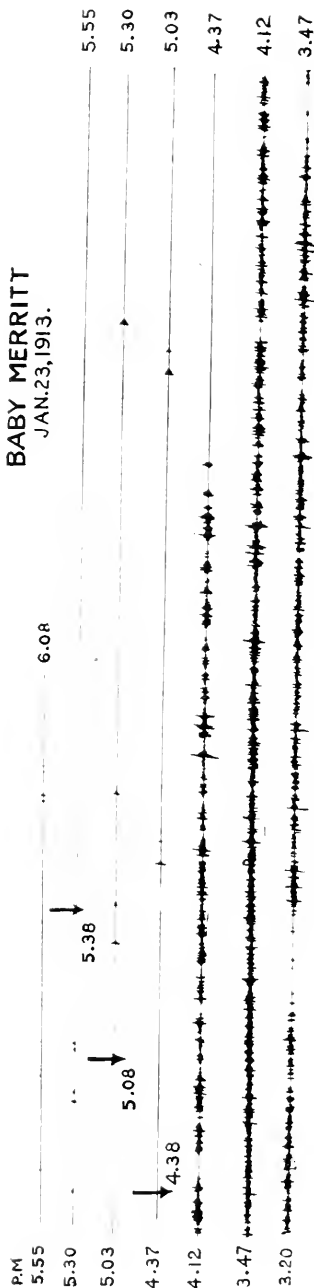


FIG. 4. Typical kymograph curve showing degree of muscular repose of infant.

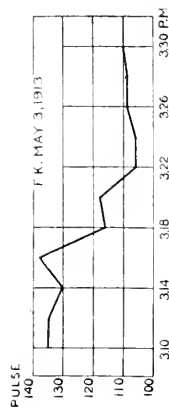


FIG. 5.—Comparison of curves for pulse-rate and muscular activity of infant.



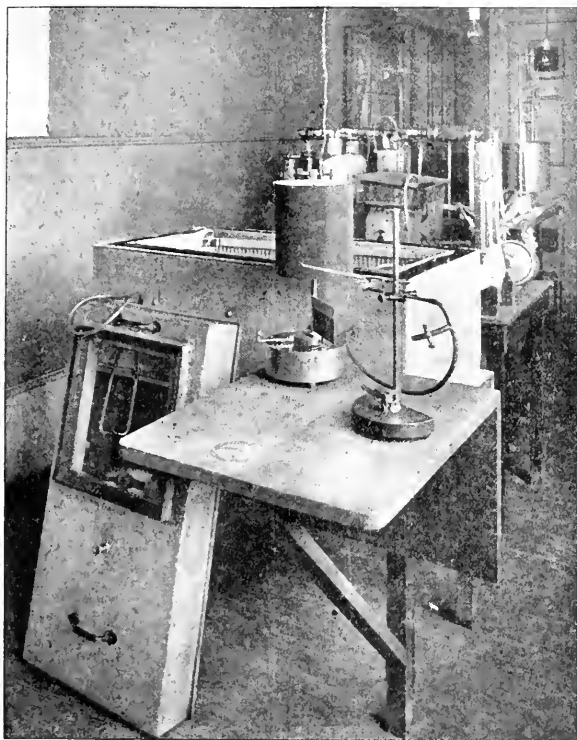


FIG. 6.—Infant respiration apparatus as installed in the Massachusetts General Hospital. In the foreground is the respiration chamber, with crib inside. The cover of the chamber rests on the floor, and through the glass window may be seen the emphyseas of the stethoscope used for recording the pulse-rate. On the shelf in front of the chamber are the tambour and kymograph for graphic records of movements. Back of the chamber are the air-purifying vessels.

quently by the nurse, and the degree of muscular repose noted from the kymograph. From the measurement of the oxygen consumption and the carbon-dioxide production, a simple calculation gives the amount of heat produced per hour. A comparison of the heat production, oxygen consumption, carbon-dioxide production, and pulse-rate is then possible. Such a comparison is shown in Table I, in which the influence of activity, like that of crying, is clearly exhibited. As is well known, it is impossible for an infant to remain quiet when awake and hence we note with these infants an increment in all factors when they are awake as compared with the observations when they are asleep. The amount of restlessness determines the increment due to activity.

With the particular children here shown, cry-

ing produced an increment in the metabolism of about 33 per cent. Our records show, however, increments very much greater. Thus we find with so weak an organism as the new-born infant, who is obviously incapable of external muscular work, we have numerous records with an increase in the metabolism, due to crying and other activity, of as much as 200 per cent. above the minimum value. Indeed, when the *maximum* heat output of 93 subjects, as obtained in the periods of greatest activity recorded on the kymograph, was compared with the *minimum* heat output, it was found that the average increment was 65 per cent., while increments of 100 per cent. or over were at times found with 10 of the infants. This alone is sufficient to emphasize the importance of complete repose for results of comparable value.

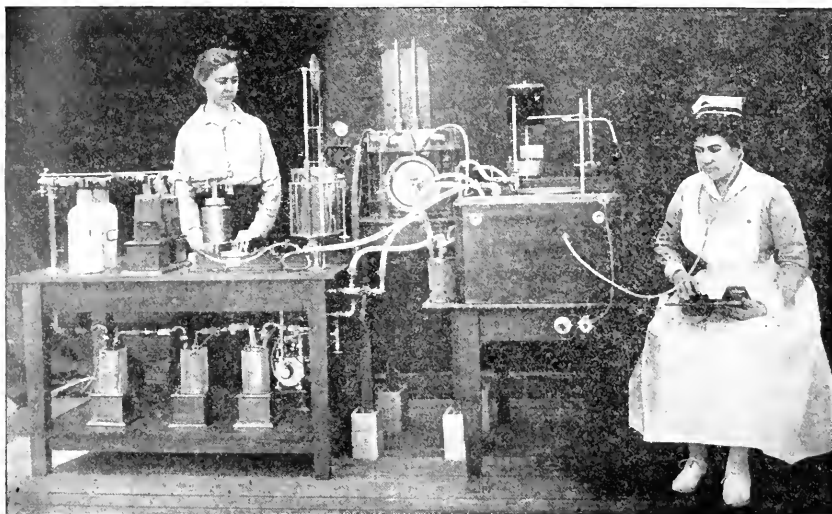


FIG. 7.—Infant respiration apparatus as used at the Directory for Wet Nurses. At the right are the respiration chamber, the tambour and kymograph for recording the muscular activity, also nurse counting pulse-rate. At the left is the absorbing system, with the carbon-dioxide absorbers and spirometer on the upper shelf of the table, the water-absorbers and blower on the lower shelf. The gas meter for measuring the oxygen may be seen in the center.

Two new-born infants are included in table I and show, as noted in the last column, a very low heat production. It is not, however, with individual cases of this type that we have particularly to deal, for with 100 new-born infants, one can readily draw general conclusions. One question of importance is: What is the average pulse-rate of new-born infants? Since with new-born infants no evidence of sex differences in metabolism has ever been observed, we may average all records. The average pulse-rate during the periods of minimum heat production is shown in Table II. It is here seen that the average pulse-rate of children slowly rises during the first 8 days of life.

TABLE II.—AVERAGE PULSE-RATE OF INFANTS DURING PERIODS OF APPROXIMATE MINIMUM HEAT PRODUCTION IN FIRST EIGHT DAYS AFTER BIRTH.

DAY	PULSE-RATE
First .....	112
Second .....	114
Third .....	116
Fourth .....	116
Fifth .....	116
Sixth .....	122
Seventh .....	119
Eighth .....	126

In connection with our experiments rectal temperatures were invariably taken at the beginning and end of experiments and no child with the slightest evidence of abnormal tempera-

ture was used for observation purposes. The temperatures practically all ranged within very narrow limits. The pronounced effect of the bath upon the new-born infant, which may be seen in Table III, is rather striking.

TABLE III.—RECTAL TEMPERATURE OF AN INFANT, TAKEN AT FREQUENT INTERVALS DURING EARLY HOURS AFTER BIRTH.

(Temperature of room, 71° F.)	
TIME	RECTAL TEMPERATURE ° F.
4.01 P.M.	Birth
4.06 P.M.	98.6
4.17 P.M.	98.6
4.20 to 4.45 P.M.	Bath in water 102° F., after oiling
4.46 P.M. (?)	97.6
4.56 P.M.	95.4 (Put in respiration chamber, well clothed)
5.23 P.M.	95.4
5.49 P.M.	95.8
6.17 P.M.	96.2
6.44 P.M.	96.8
7.02 P.M.	96.8
7.34 P.M.	97.4
7.59 P.M.	97.1
8.25 P.M.	97.6
8.50 P.M.	97.6

This sub-normal temperature of new-born infants and the imperfectly developed temperature regulations were clearly reflected in the values found for the heat production on the first day of life, for if we take the heat production as computed for the 24 hours and compare it with the age in the first week of life, we note

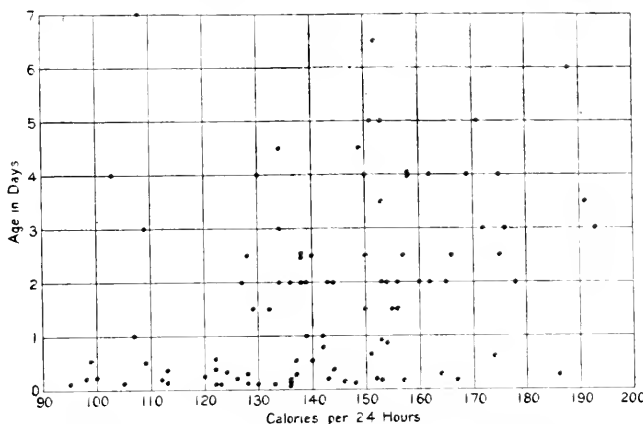


FIG. 8.—Minimum heat production of new-born infants per 24 hours referred to age.

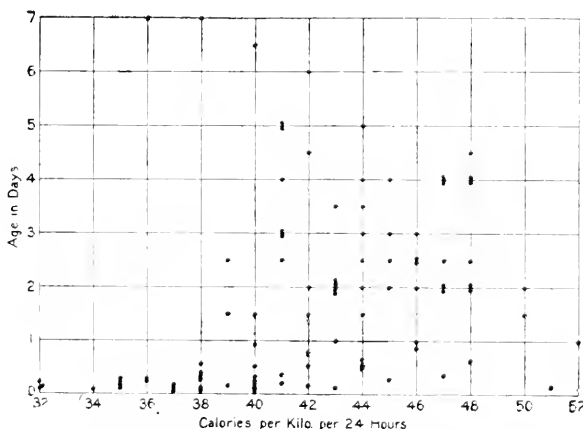


FIG. 9.—Minimum heat production of new-born infants per kilogram of body weight per 24 hours referred to age.

that practically all of the low values occur on the first day. (See Figure 8.) A careful analysis of the heat production after the first day of life showed much more general regularity.

Since the babies varied somewhat in weight, the heat production referred to the body-weight is of interest. By computing the heat output per kilogram of body-weight, we find the children on the first day of life likewise tend to have the lowest values. (See Figure 9.)

It is commonly believed (although probably no one factor has done more to disturb this deduction than has the measurement of these iden-

tical babies) that the heat production of warm-blooded animals is exactly proportional to the surface area, a round number of 1,000 calories per square meter of surface area being that most commonly considered as the 24-hour heat production. We have computed the basal metabolism of these infants during the first 8 days after birth and find *average* values very much lower than the hypothetical 1,000 calories, these ranging from 592 calories on the first day to 702 calories on the eighth. The *individual* values (see figure 10) range from 460 to 732 calories per square meter per 24 hours. Here again we

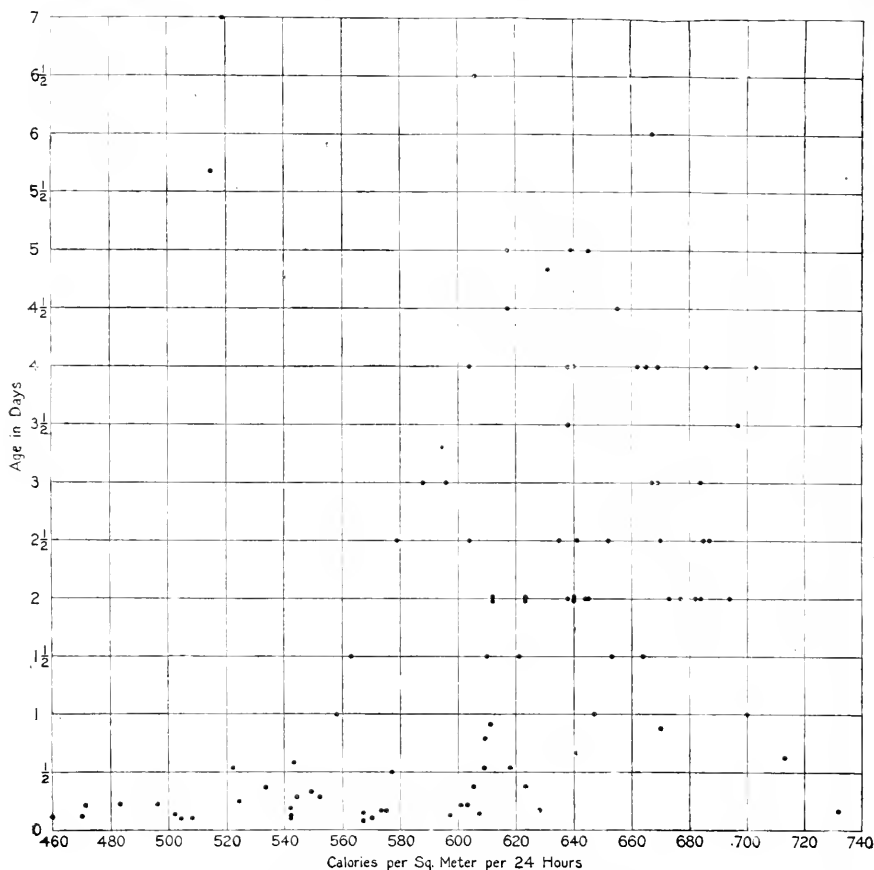


FIG. 10.—Minimum heat production of new-born infants per square meter of body-surface per 24 hours referred to age.

see a disturbance on the first day of life due, we believe, to the imperfect development of the mechanism for temperature control. From the average of 94 subjects during the first week of life, we found that the heat production per square meter of body surface is 612 calories and per kilogram of body weight 42 calories, while the total basal heat produced per 24 hours by the new-born infant is 143 calories.

As previously stated, from an analysis of all of our measurements for male and female new-born infants, it is very clear that there is no differentiation as to sex and consequently we may apply our standard average values to both boy and girl babies. In summation then, we may say that the pulse-rate of a new-born baby

is, on the average, 112 per minute, when the child is resting quietly. The heat production is 143 calories per day, or about one-tenth that of the average woman. The heat production per kilogram of body-weight is 12 calories, and the heat production per square meter of body surface is 612 calories. These data are fundamental and make possible all subsequent comparisons with new-born infants.

Whatever interest the physiology of the new-born may have to the pediatrician, much more general interest is to be found in the study of the energy requirements and physiological activities of children during the process of growth. It has been pointed out that growing children present most unusual conditions for studying the

physiological variations in the normal organism, for the period of a few months in the child's life results in more metamorphoses than periods of corresponding years in adult life. During the period of rapid growth, the food intake must supply not only the maintenance heat, *i.e.*, the overhead charge, but it must supply material for growth, addition of tissue, and replacement of tissue; and finally, the extraordinary activity of growing children calls for a proportionately very large energy intake.

Deferring for the time being a consideration of the two energy factors for growth and physical activity, we can properly study the basal requirements of growing children and determine them under such conditions of repose and absence of digestive activity as to make them comparable not only with each other but with the values that we have already determined for newborn infants and likewise for the well-established series of normal adults.

Two methods of studying growing children suggest themselves. One is to study relatively large numbers of infants of different sex, age, height, and weight; in other words, by studying *individuals* and comparing the average values found, we may note the influence of age, height, weight, and sex upon the heat production. This necessitates at least two experiments with each subject but to be of value requires a large number of subjects.

The other method—obviously the most difficult—is to study the same individual over a longer period of time, months, if not years. To retain such control of children as to have them available for metabolism experiments during a considerable period of time presents many difficulties. Thanks to the untiring energy of Dr. Talbot, we have been able to include in our series some 25 children who have been studied over periods ranging from several months to three or four years. Since the children of wet-nurses studied at an early age frequently are farther and farther dispersed as time passes, making a periodic round up for observations increasingly difficult, we are fortunate in having attacked the problem from *both* standpoints.

When we consider that the ideal conditions for a study of the metabolism are complete muscular repose and no food in the stomach, it is at once evident that the latter condition especially is not easy to secure with young children, for in the normal state the growing child has more or

less food in the stomach, particularly in the earlier years. It should be stated at the outset, therefore, that in many of our observations with young children it was necessary to include periods with more or less digestive activity. Special attention was given to this point in an attempt to quantify the influence of normal feeding upon the basal metabolism. The influence of different amounts of food upon the metabolism of adults is well known; our evidence implies that with children the influence is proportionately very much less, for apparently that quota of the food ingested which goes to the deposition of tissue does not participate prominently in the stimulation of the metabolism.

An ideal study of the energy requirements of children would be one, furthermore, in which children in all stages of nutrition should be included, both those distinctly overnourished as well as those who are undernourished. Believing that our best service to medicine would be to contribute to a more extensive knowledge of the strictly normal child, we have therefore laid special emphasis upon the normality of our subjects.

The consideration of what is normal in a child brings up immediately several difficult questions. An average or normal for adults, determined from large masses of data secured generally through life insurance companies, has been accepted by practically all statisticians and actuaries. For this purpose men and women have been averaged and grouped according to age, weight, or height, and the *average* adult, or so-called normal, has been taken as the normal standard. It is important to bear in mind, however, that this *average*, or so-called normal, includes individuals that deviate widely from the average. Thus, there is a large proportion of overweight men and women and likewise a large proportion of underweight men and women, but these two extremes tend to balance each other. We believe that in considering the *normal* for the growing child, a gross error has been committed in blindly accepting the *average* weight for height or age as normal. Contrary to the conditions with adults, the overweights among children do not counterbalance the underweights, for one has but to stand at the entrance of one of our public schools to note the relative rarity of obviously overweight

children and the great frequency of underweight children.

It has been a common custom to consider the weight for age as an index of the nutritional condition of the child. As a physiological and physical entity, this seems fundamentally erroneous, and we welcome Dr. Holt's recent discussion of this point. The weight for height seems much more logical. If the height is too small for the age, one may logically assume either that the child is the offspring of a family of normally short stature or one may suspect deficiency in the skeletal growth. On the other hand, a child may be of the normal or average height for the age and yet be definitely undernourished and underweight. In the first instance one may suspect deficiency in the skeletal growth and in the second instance, one suspects deficiency in caloric intake. If this reasoning be true, then obviously so-called normal curves for children are too low, for the *normal* on this basis, as we have seen, includes a much larger proportion of undernourished children than of overnourished children. Bearing this differentiation in mind in the analysis of the average weights for heights and weights for age of our children we have attempted to eliminate those who are obviously much below the so-called average or normal weight. Although certain underweights crept into our observations, owing to scarcity of material, the results obtained with them are not included in our discussion of normal data.

It is thus seen that to establish the exact normal weight of children is a matter of considerable difficulty, for it is clear from the foregoing discussion that the *average* is not *normal*. If we are to have better babies and better children, we believe that dietitians, physicians, and mothers should disregard entirely the misleading averages and strive for a condition of nutrition measurably better than that indicated by the so-called average or normal line. From the results of the Medico-Actuarial Investigation, it is clear that the probability of longevity is distinctly greater for young men and women who are overweight, *i.e.*, over the average weight, up to about 30 years of age. Beyond that age the reverse is true and excess flesh is detrimental to the probability of long life. While the Medico-Actuarial Investigation did not include individuals of the ages when the weight changes are rapid, it is reasonable to infer that if over-

weight is advantageous for young people from 18 to 30 years of age, overweight with children may in all probability be considered as advantageous.

The large amount of data resulting from our concentrated study of children up to two years, mostly breast-fed babies of wet-nurses, was obtained with subjects whose normality was satisfactorily established. Through the courtesy and keen appreciation of the superintendent of the New England Home for Little Wanderers, Dr. Frederic H. Knight, we were able to establish a laboratory in that institution for observations on children over two years of age. Investigations have proceeded with their more or less floating population of children for about two years and, at the moment of speaking, are still in progress.\* But the population of even so admirably managed an institution as the New England Home for Little Wanderers must be considerably more heterogeneous in character than the babies of wet-nurses. Children are given excellent care in that institution and usually increase in weight, as not infrequently they are somewhat underfed previous to their entrance. And yet, making our selection as best we could, there still remains the fact that the subjects of these later observations more nearly approach the *average* than the *ideal*.

With increase in the size of the children studied, a somewhat larger respiration chamber was necessary; indeed, as the investigation progressed, it not infrequently happened that two sizes were used alternately. Finally a chamber sufficiently large to contain a child as old as 14 years was employed. In every instance the attempt was made so to adjust the experimenting as not to have the chamber disproportionately large for the subject observed.

The apparatus employed for studying the older children, which was installed in the special laboratory at the New England Home for Little Wanderers, is substantially a duplicate of the one used for normal babies, with the single exception of the fact that the chamber was much larger and hence of a somewhat different type of construction.† While with the babies the cover of the chamber shut down like the lid of a trunk, in this case the cover was of semi-

\* The apparatus is under the skilful direction of Miss I. A. Boles of the Laboratory staff and the children receive most excellent care from Mrs. Dorothy A. Peabody, the nurse in charge.

† This apparatus is a small form of the clinical respiration chamber described by Benedict and Tompkins, *Boston Medical and Surgical Journal*, 1916, Vol. clxxiv, pp. 857, 898, and 939.

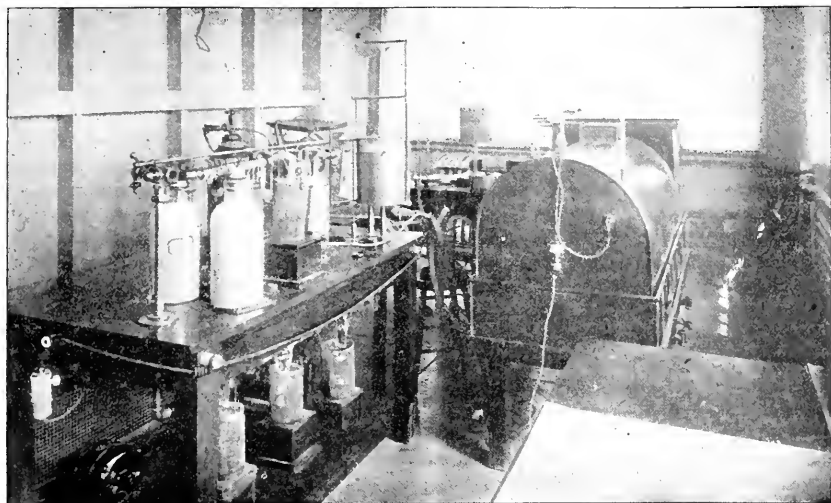


FIG. 11.—Infant respiration apparatus as used for children at the New England Home for Little Wanderers. The respiration chamber, with rounded cover and thermometers, is near the center of the picture, the absorber table at the left. On the upper shelf of the table may be seen the carbon-dioxide absorbers and the spirometer; on the lower shelf are the blower and the water-absorbers. Behind the table are the large oxygen cylinder and gas meter. The tambour and kymograph stand on a small table in the rear.

cylindrical form and was suspended by two ropes connected with a counterpoise, thus providing for raising and lowering the cover. When the cover was lowered, it entered a narrow water seal which made it air tight. A rectangular window in the cover provided for illumination. A general view of the laboratory is shown in Figure 11, in which the respiration chamber is a little to the right of the center, and the table containing purifying vessels for the air at the left.

In studying the change in the energy requirements of the resting, quiet child as growth progresses, we may first consider the energy changes accurately measured on the same individual. We have certain subjects who have been followed almost from birth to four years of age, others who have been followed for shorter periods, beginning some time after birth. The labor involved in following a child for several months, if not years, is much greater than one would realize. It is to be hoped that some time one or more children will be followed from birth to well into adult life. This is something to be striven for. A typical example of the changes in the metabolism of the same individual at different ages in early youth may be seen from the results obtained with a girl baby, G. C.

This infant, the child of a normal wet-nurse, was studied from the age of 10 months to 4 years, 3½ months. The heat production under standard conditions was frequently measured. The individual values have been plotted and are given in Figure 12. As no attempt has been made to smooth the curves, the irregularities are strikingly exhibited. Considering first the total heat production as the age increased, we can see that there was a sharp rise in the heat production until about 2¼ years. Subsequently the total heat production remained reasonably uniform, that is, this girl baby at 10 months produced approximately 500 calories, and at 4 years and 3½ months 720 calories, or an increase of approximately 50 per cent.

Since there was simultaneously a pronounced change in the body-weight, the heat values per kilogram of body-weight are of interest when compared with age. Here the effect of age is shown to be very pronounced, for we find that at one year the heat production was 70 calories per kilogram and that at 1 year 3½ months it dropped to 44 calories per kilogram. Thus at 4 years and 3½ months the heat per unit of weight was decidedly lower and the mass of protoplasmic tissue had less heat-producing

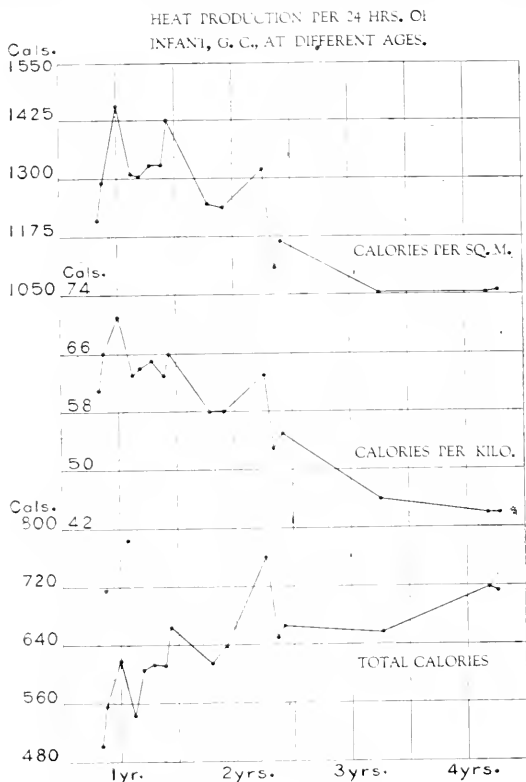


FIG. 12.—Basal heat production per 24 hours of normal infant at different ages.

power than at 1 year when the metabolic changes were very high.

The great irregularities in the heat production per square meter of body surface found with younger children is strikingly shown in the upper curve, in which the range is from 1,456 calories at one year of age to 1,059 calories at 4 years 3½ months. This is a decrease of over 25 per cent. and is strikingly at variance with the popular conception of a "law" which signifies a uniformity in heat production per square meter of skin area.

Since most of our continuous, or semi-continuous, observations on children pertain exclusively to the earlier years of growth, we have no data of comparable nature for later years, and the method of studying a number of individuals and establishing a basal value in each case, subsequently to be used in a scatter dia-

gram or chart, must be followed. In our final summation of results we consider that the child who changed in age six months or in weight one kilogram, or 10 per cent. in weight, can be considered as a new individual and may thus be accorded a special value in our plots, charts, and curves.

While with new-born babies no sexual differentiation was found, it has been demonstrated with adults that women have a measurably lower metabolism than that of men of the same height, age, and weight. Consequently in the discussion of our results, we have separated the boys from the girls. Perhaps the simplest method of considering the metabolism of a group of boys is by comparing the total calorie production to age. For this purpose we have plotted a chart (Figure 13) showing the total basal metabolism of boys of various ages, plot-



ting these values against the ages of the subjects. It is obvious that the number of total calories becomes larger as the age increases. The chart for girls (Figure 14) is similar to that for boys, for as the age increases the total caloric output increases. Since, however, we have found with adults that, although the age factor is of considerable moment, it is of far less importance than weight, we may have here simply an expression of the fact that as children grow older they likewise grow heavier in weight, and the larger organism has a larger heat production. When the basal metabolism is plotted against the weight (Figure 15), we find here also that as the weight of the boys increases the heat increases. Indeed, the curve representing a probable general trend shows the individual points rather more closely grouped about the central line in the curve for the weight comparison than in that for the age comparison. The curve for girls (Figure 16) shows similar phenomena. It is important to bear in mind, however, that these and all subsequent charts deal solely with the basal metabolism, not with the total 24-hour energy requirement, which includes not only the maintenance or "overhead" charge, but likewise the extra costs for the muscular activity which is so pronounced in the case of growing children.

With so rapidly changing an organism as the growing child, it is of interest to determine, if possible, whether or not there is a specific relative change in the rate of metabolism with age and weight. In other words, it is of interest to compare the metabolism of a 5-year old girl with that of a 12-year old girl, just as it is of interest to compare the metabolism of a 100-pound man with that of a 200-pound man. A 5-year old girl weighs not far from 18 kilograms. A 12-year old girl weighs approximately 37 kilograms, or about twice as much. Hence from the standpoint of weight alone it is as desirable to compare the 5-year old girl with the 12-year old girl as it is to compare the 100-pound man with the 200-pound man. Physiologists have long recognized the difficulty of making these comparisons, for even so commonly accepted a method of comparison as the heat production per unit of weight requires the assumption that each weight unit of the body has the same heat-producing power as the others. That is, if we compare the heat production of a 100-pound man with that of a 200-pound man, we

are obviously not dealing with like proportions of bone, flesh, and fat in the two men. When we compare a normal, plump, healthy baby with an atrophic baby, these variations are even more striking. With these mental reservations it is still the most common custom of physiologists to express the heat values per kilogram of body-weight. In accordance with this usage we have plotted the values for our children of all ages from 8 days to 15 years, separating the sexes so as to show the heat production per kilogram of body-weight for boys and girls.

The values for boys (Figure 17) show a quite different type of curve from that noted in the comparison of the values for the total heat production, inasmuch as there is a distinct tendency at the age of one year for the heat production per kilogram to be higher than that at the end of 6 months and subsequent to one year. This implies that at the age of one year there is a specifically high basal metabolism which is of itself an extraordinarily important physiological fact. While the number of points on the chart is not so great as one could wish, it still is reasonably clear that the distinct trend of the points after the age of one year is downward, somewhat in accordance with the straight line drawn on the chart. It is doubtless doing violence to mathematics even to infer that after the fifth year a straight line represents the trend of metabolism, and one may fairly challenge the drawing of *any* line or curve to indicate the supposed general tendency in a diagram in which the individual points are as scattered as they are here. Clearly with children we are dealing with physiological entities and not with crystalline structures, each with its mathematically established planes.

There are no markedly irregular groupings in this scatter diagram or line. Some writers have emphasized the supposed profound alteration in the metabolism as the child approaches puberty, particularly about the age of 12 years with boys. Here we find nothing to indicate special abnormality or irregularity. An examination of the curve for girls (Figure 18) shows similar phenomena. *i.e.*, the high values at the age of one year, the distinct tendency for the line to fall from one year to 14 years, with no obvious disturbance in the regularity of the line at or about puberty.

Since we have seen that with growing children age is expressive of great weight changes,

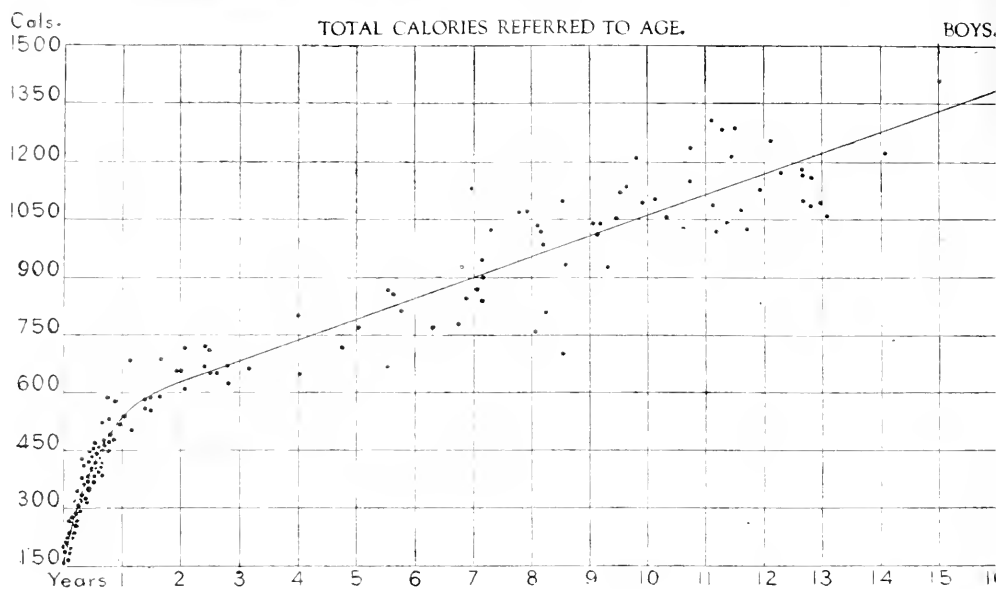


FIG. 13.—Basal heat production of boys per 24 hours referred to age.

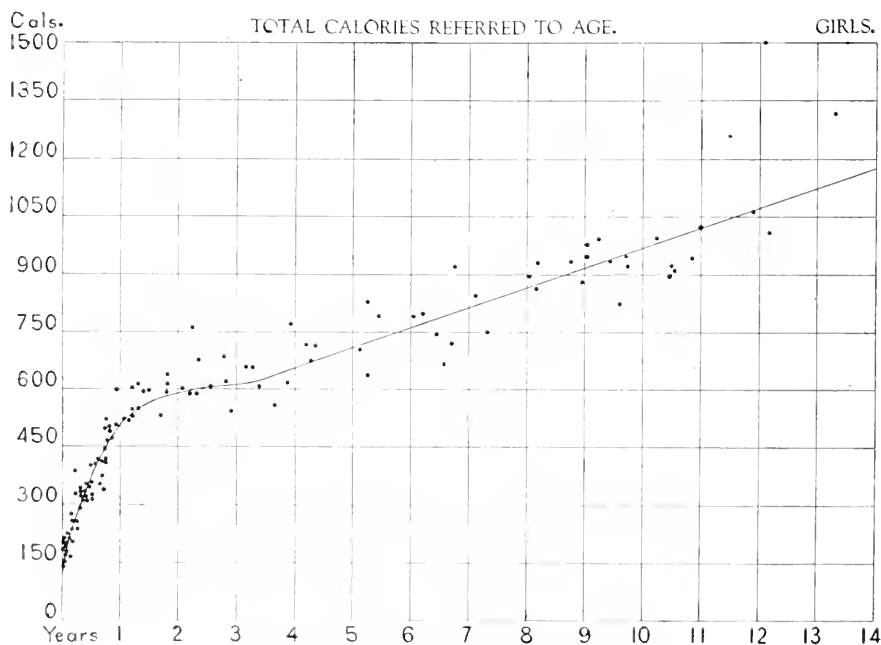
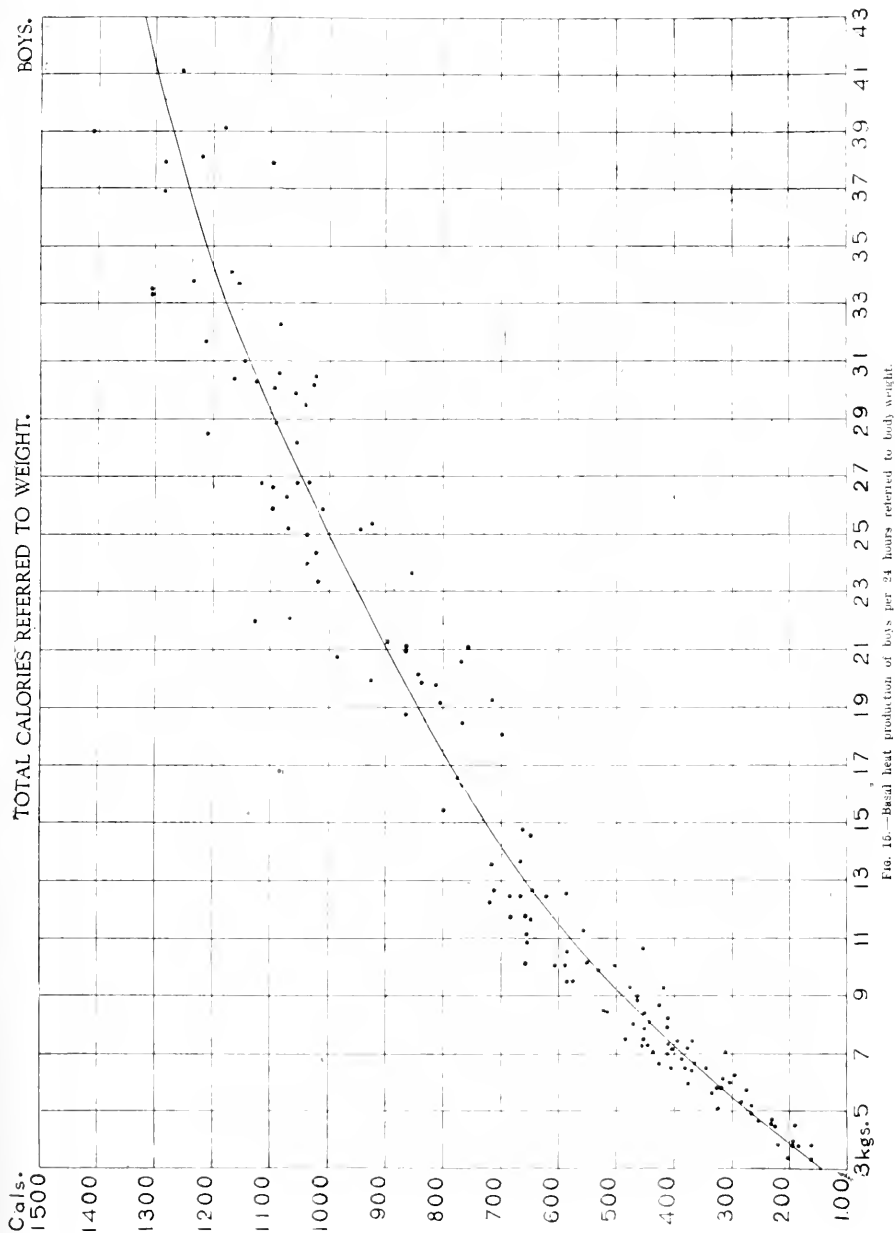
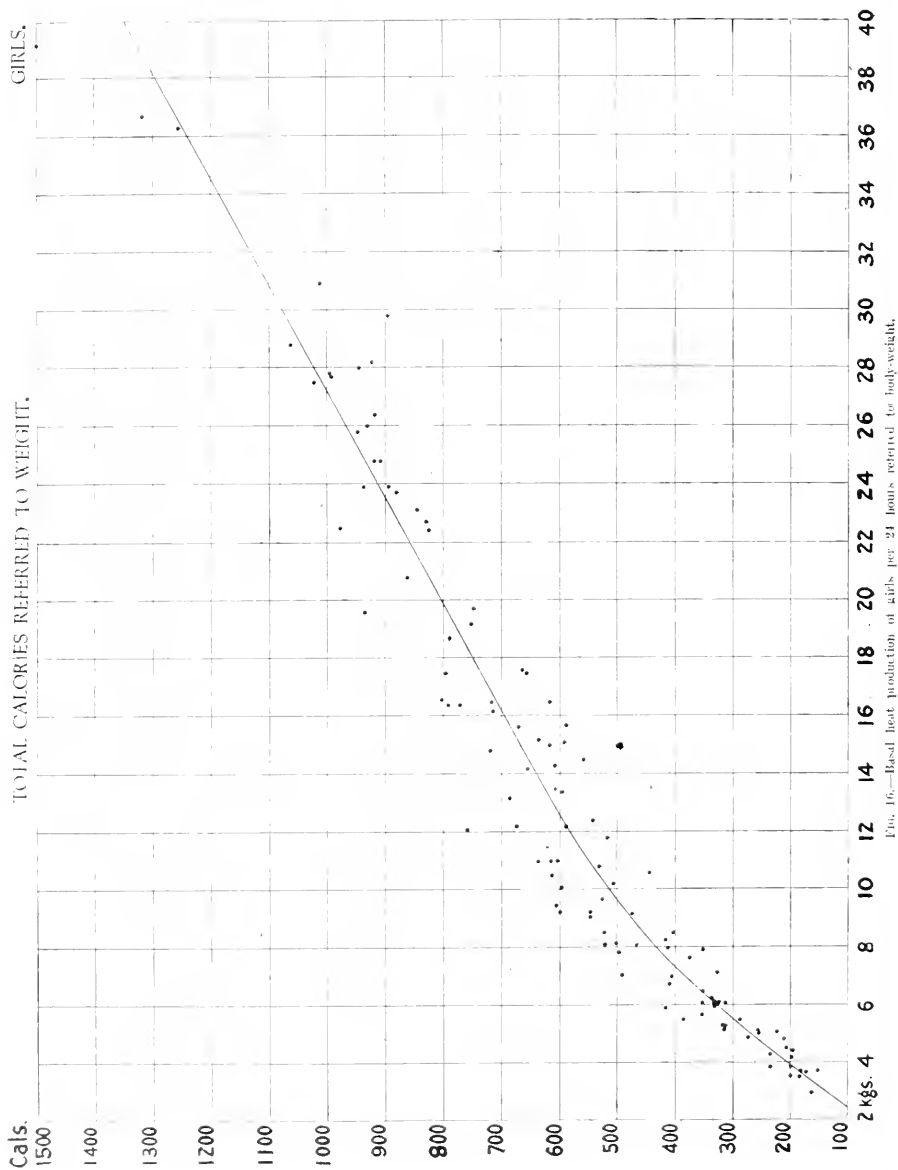


FIG. 14.—Basal heat production of girls per 24 hours referred to age.





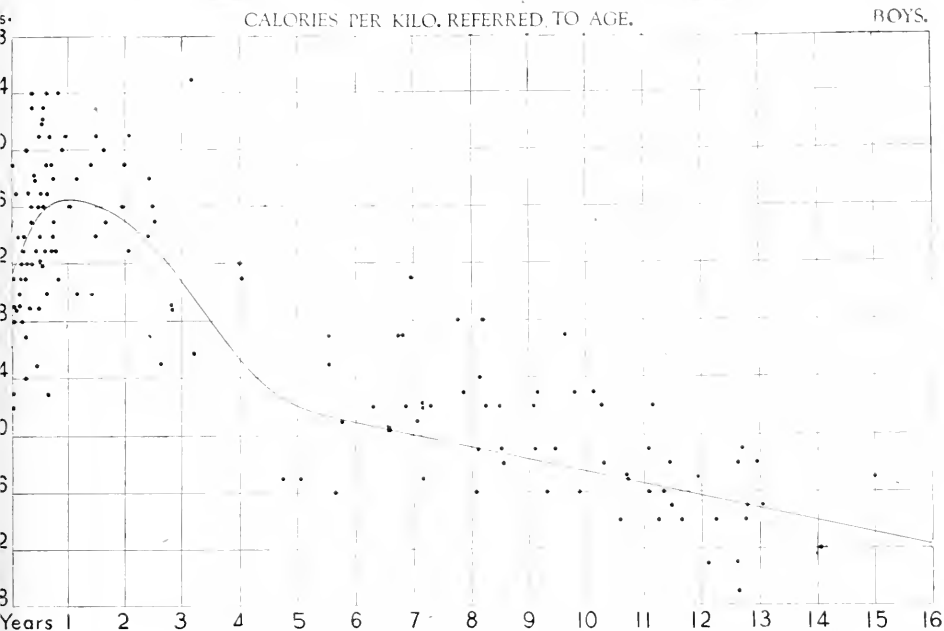


FIG. 17.—Basal heat production of boys per kilogram of body-weight per 24 hours referred to age.

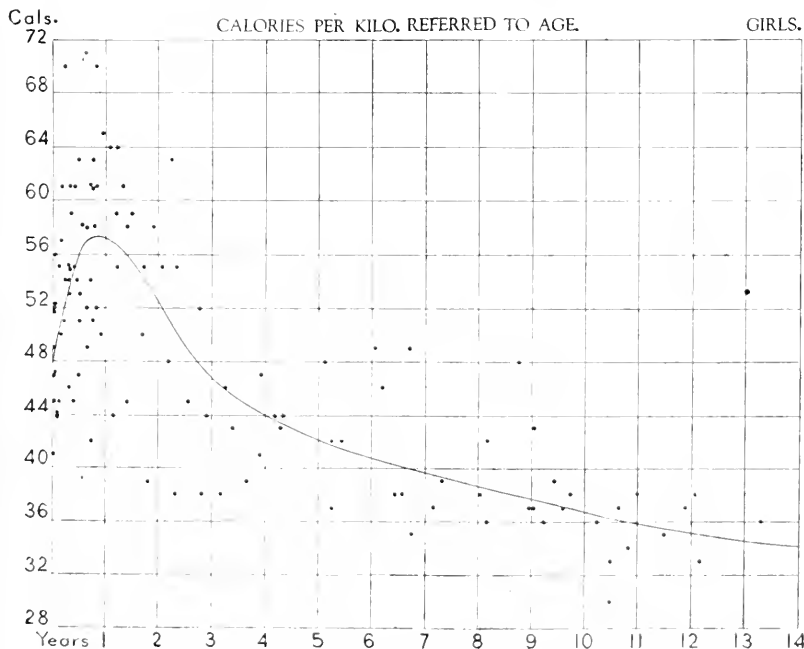


FIG. 18. Basal heat production of girls per kilogram of body weight per 24 hours referred to age.

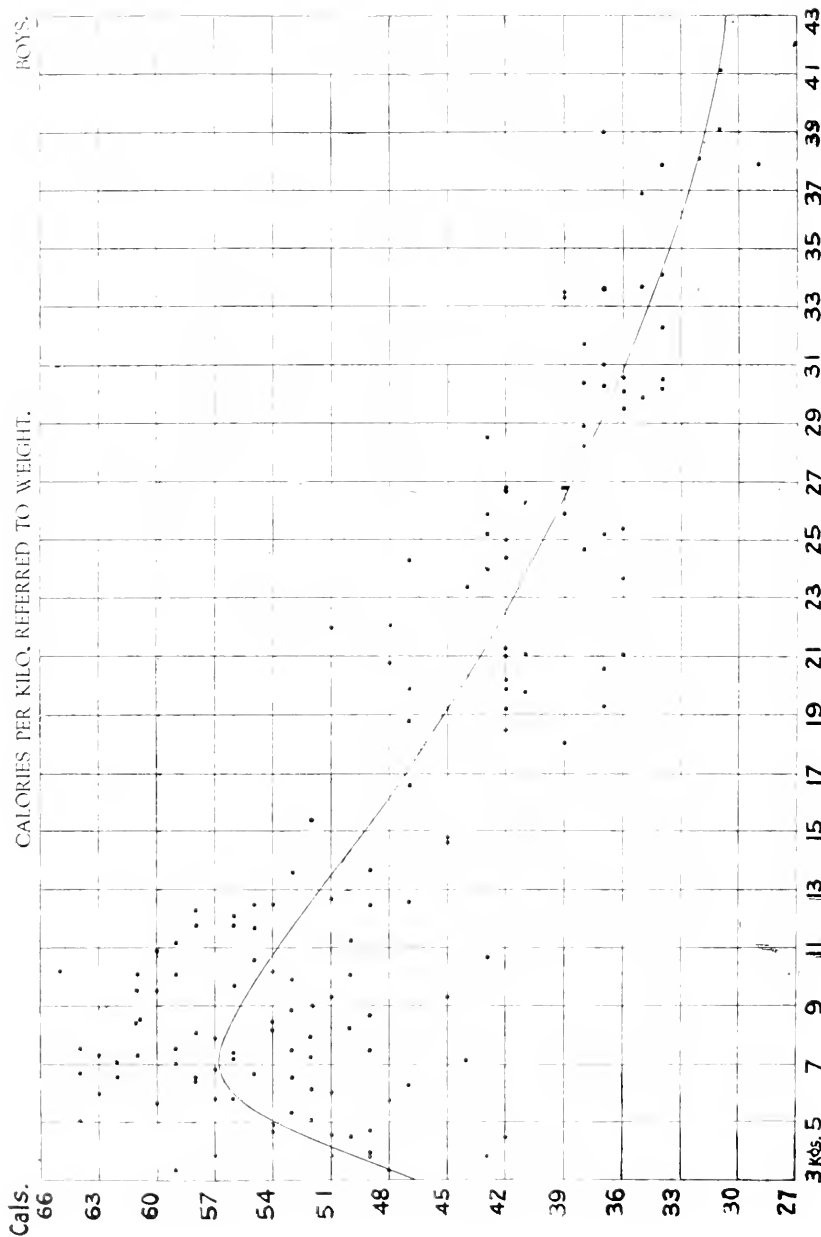


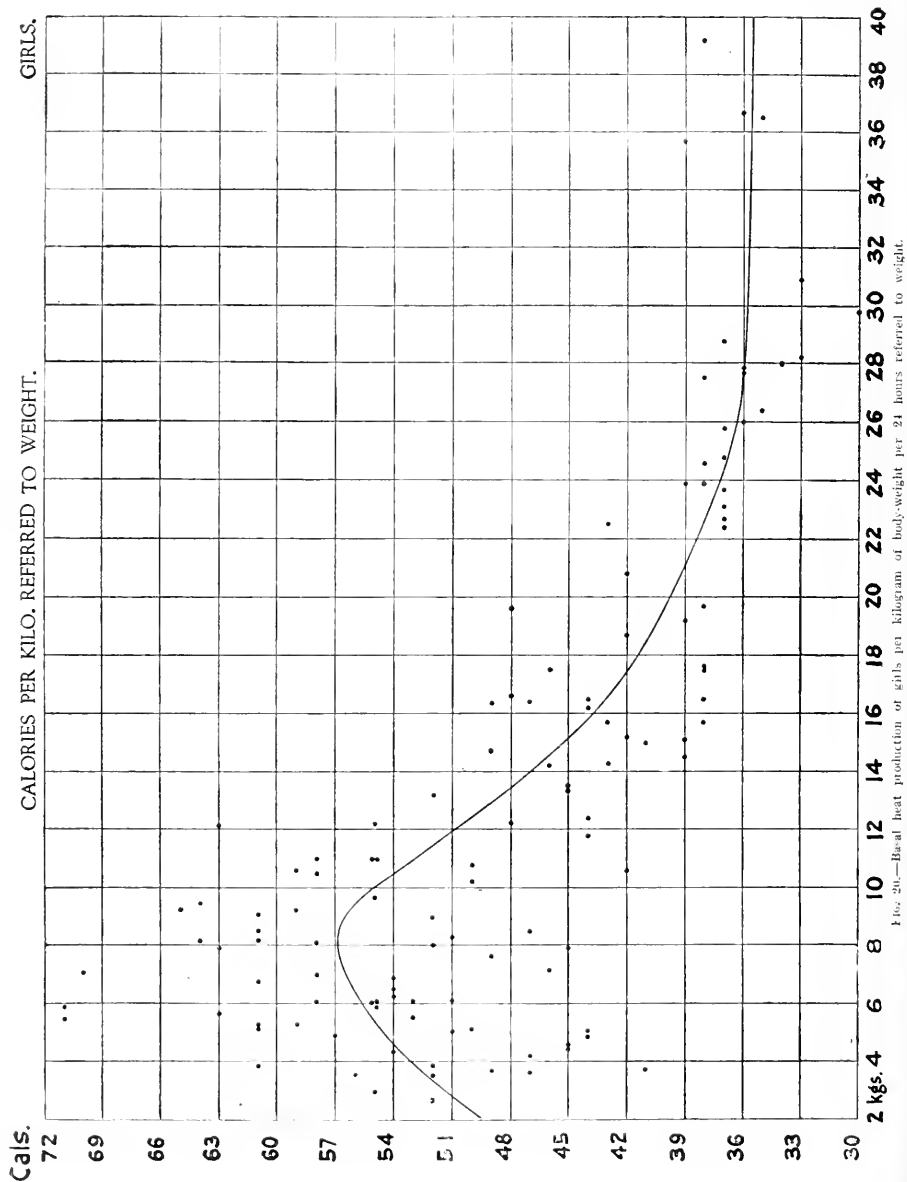
FIG. 19.—Basal heat production of boys per kilogram of body-weight per 24 hours referred to weight.

the differences in age probably in large part simply reflect the concomitant weight changes. A study of the heat production per kilogram of body-weight for the different weights is therefore somewhat more logical than a study of the heat production per kilogram for the different ages. On this basis the boys show a curve (Figure 19) strikingly similar to that for age, the wide distribution of the individual points again showing the futility of assuming any physiological law regarding the basal metabolism in early youth. Our hypothetical line suggests, for example, that the metabolism of a 7-kilogram baby is, on the average, 57 calories per kilogram of body-weight, and yet actual observations show one value of 44 calories and another of 64 calories. The plot for girls (Figure 20) exhibits similar inconsistencies. The general line is wholly problematical and perhaps unjustifiable. At 7 kilograms, for example, the curve indicates an average metabolism per kilogram of body-weight of 56 calories, but two values on the chart for this weight show a heat production of 46 and 70 calories, respectively. With both boys and girls the points are somewhat more compactly grouped for weights about 14 kilograms and higher.

Recognizing the defects in the method of comparing the heat production per kilogram of body-weight, we may further compare these data by a very alluring method which has long been used, namely, by employing the heat production per square meter of body surface. This method of comparison is fundamentally based upon the conception that the heat lost from the surface of the body is greater the larger the surface. While the physiological soundness of this contention has been severely attacked, we may still use the surface area of the body as a factor in the comparison, if we discriminate clearly as to the significance of such comparison. It has been shown that the surface area of the body, the blood volume, the cross section of the aorta and trachea (and probably the total mass of active protoplasmic tissue) develop in accordance with a well-known morphological law of growth, in which the relationship is not directly in proportion to the weight, but more nearly as the two-thirds power of the weight. Since the body surface, as measured by the ingenious method of DuBois, shows close correlation with the two-thirds power of the weight, we may take this as an index of the general

differences in the amounts of active tissue of the body and hence it may logically be used for comparison purposes, if the fictitious causal relationship, which has so long dominated the minds of physiologists, is not retained.

With the children used in our observations, we have taken pains to measure the body-surface area carefully, in accordance with the Du Bois formula. Hence we can compare different children on this basis. As previously stated, an ensnaring hypothesis long maintained by physiologists is that the heat production in warm-blooded animals is the same per unit of surface area, practically irrespective of species, *i.e.*, not far from 1,000 calories per square meter per 24 hours. We have computed the basal heat production of our children on the basis of per square meter of body-surface per 24 hours and have plotted them on a chart against age. (See Figures 21 and 22.) If there were any direct relationship between the area and the heat production, we should expect to find uniformity in these values, but quite the opposite is observed. Precisely the same degree of difference at different ages is observed as was noted with the children per kilogram of body-weight. Higher values are found about the age of one to two years with a possible tendency for the values to decrease with greater age, although the distribution of the points is so wide as largely to invalidate any arbitrarily drawn, smoothed curves. It is important now to bear in mind that the differences in size at different ages are practically eliminated in using the body-surface for comparison. This phenomenon is noted with both boys and girls, namely, a distinct lack of constancy, thus refuting the popular notion that the heat production is constant per square meter of body-surface. Furthermore, the age element in children, with special stress on the age of puberty, is shown to play no particular rôle except that about the age of one to two years, high heat values are found on the bases of both body-weight and body-surface. No obvious tendency for a deviation of the line is noted at or about the age of puberty with either boys or girls. In both methods of computation for comparative purposes, *i.e.*, per kilogram of body-weight or per square meter of body-surface, the curves are characterized by exceedingly low values during the first week, a rapid rise at about one or two years, and then a





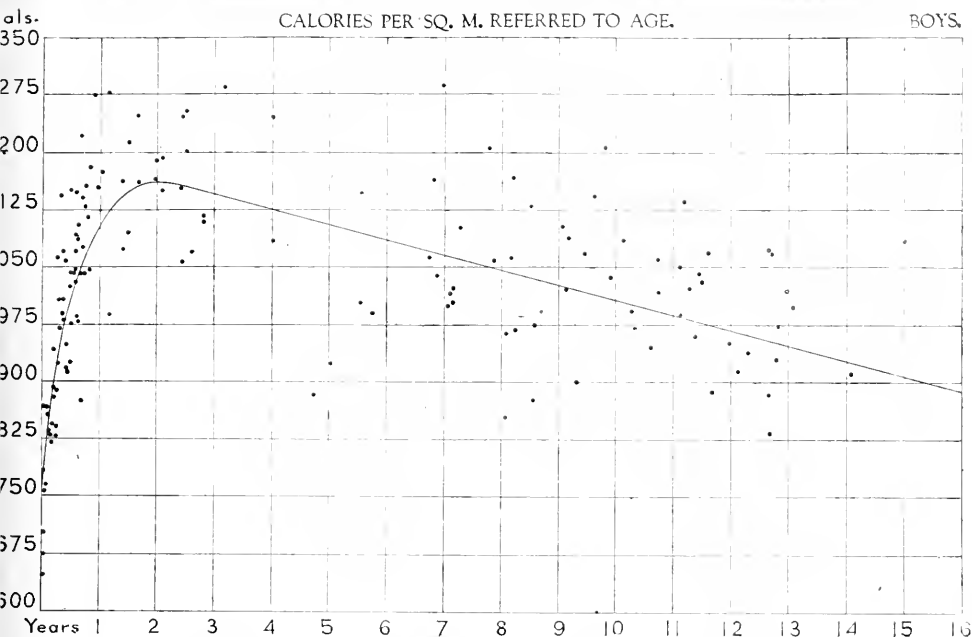


FIG. 21.—Basal heat production of boys per square meter of body-surface per 24 hours referred to age.

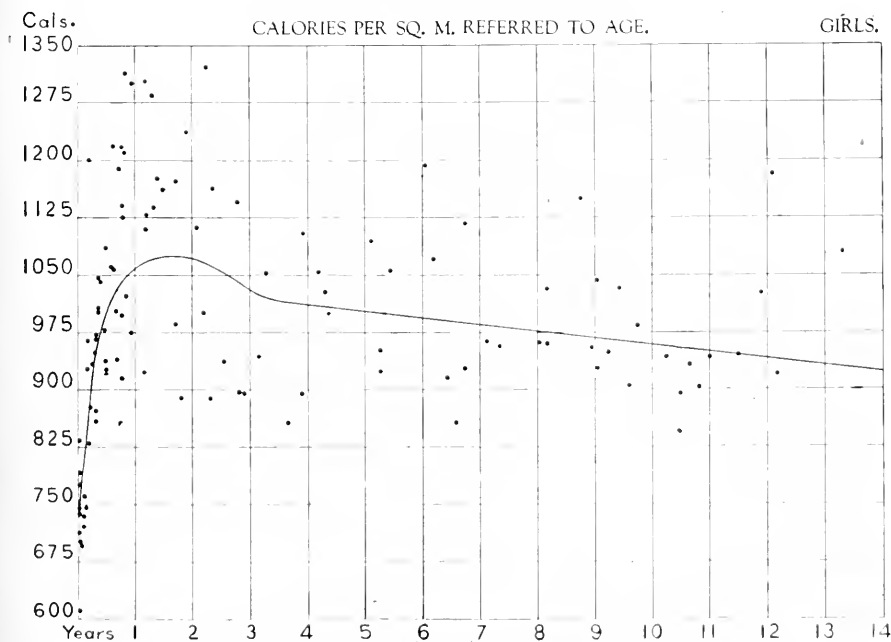
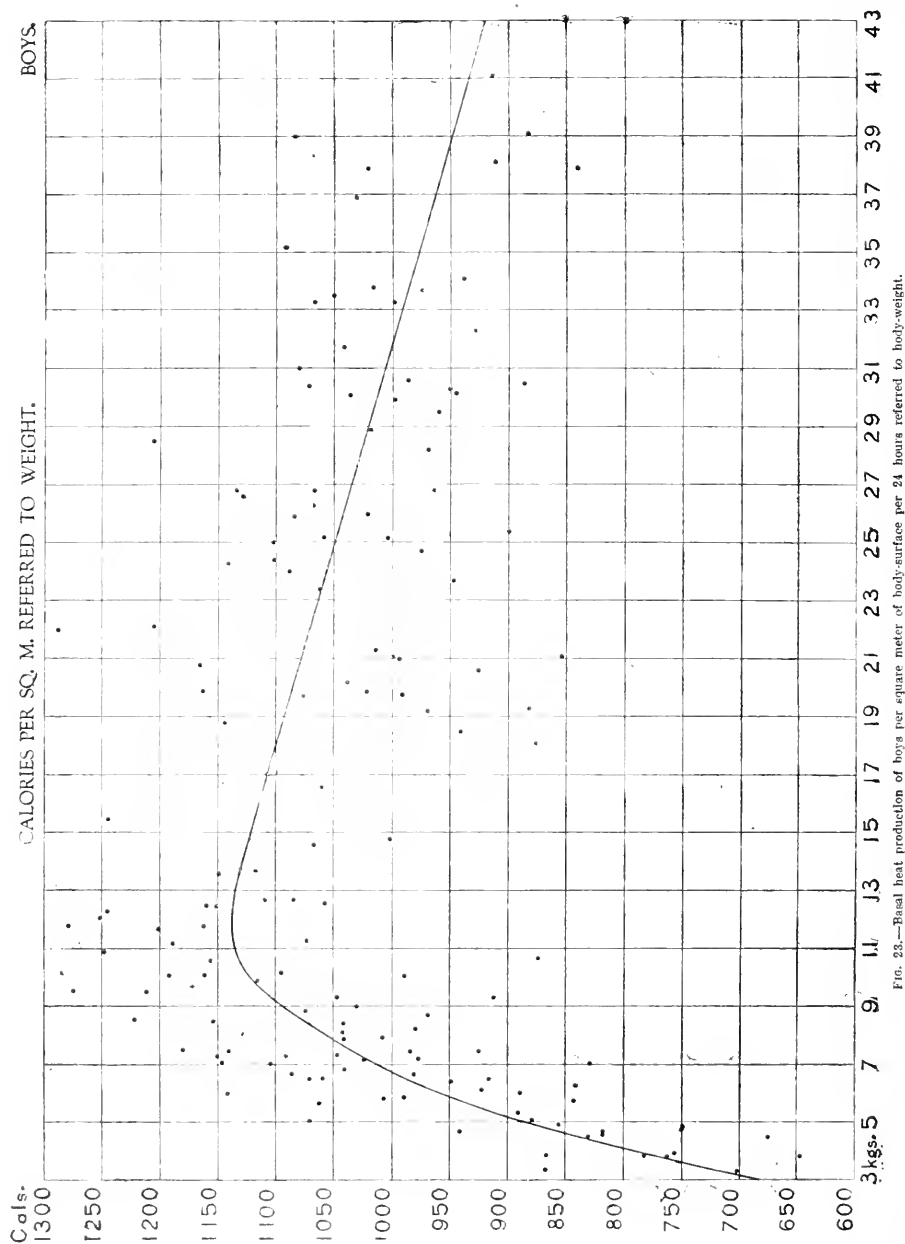
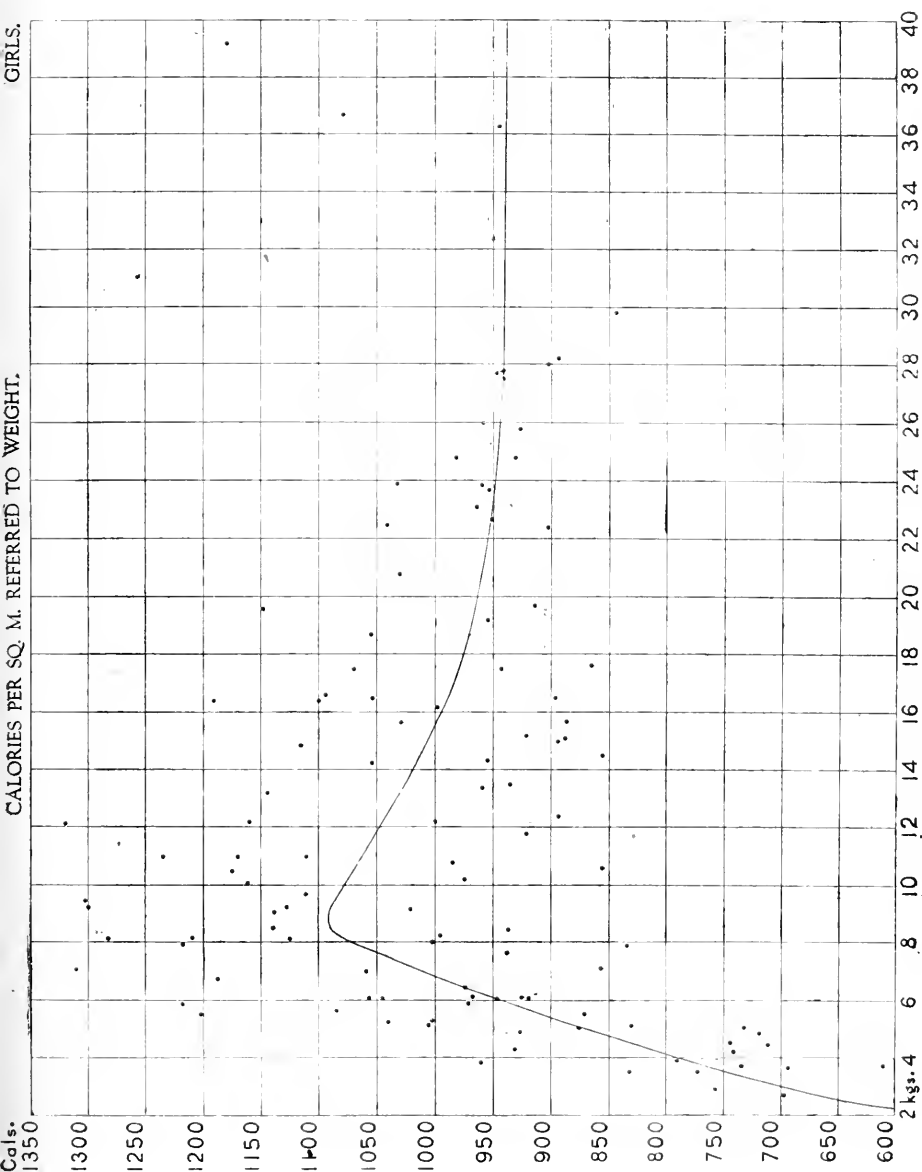


FIG. 22.—Basal heat production of girls per square meter of body-surface per 24 hours referred to age.





steady decline to 14 or 15 years, beyond which our observations do not extend.

While these statements apply to the general course of the hypothetical curves arbitrarily laid down on the several scatter diagrams, the deviations of the individual points are so great as to rule out immediately all claim to a regularity in relationship between heat production and age, either per kilogram of body-weight or per square meter of body-surface, that can fairly be designated as a physiological law.

As previously stated, since the age element may, with growing children, be only indicative of changes in weight, the true relationships may best be expressed by referring the calories either per unit of weight or per unit of area to the true weight rather than to age. The calories per square meter of body-surface, referred to the total weight, are given for boys in Figure 23 and for girls in Figure 24. Any slight semblance of regularity which appears possible from figures 21 and 22, when the calories per square meter were referred to age, practically disappears when these values are referred to weight, although here again the curve suggesting the possible trend in metabolism on this basis is but arbitrary. The deviations either side of the hypothetical line are altogether too great to more than hint at a possible general trend.

So far as average values are concerned, the curves may be taken as indicating general trends, but one cannot say that every 12-year old boy will have a basal metabolism of 970 calories per square meter of body surface or that every 12-kilogram girl will have a basal metabolism of 50 calories per kilogram of body-weight.

In this respect, perhaps, our results are discouraging. It would have been infinitely simpler for the clinician and the physiologist to have dealt with an approximately constant caloric requirement in accordance with weight and age. Still all large problems must be solved not by the investigation of one patient or one subject, but by the investigation of many. That these values differ widely from earlier results cited within a year as "absolutely accurate" is, we believe, not surprising. Few, if any, colleges or medical schools have had men with a breadth of vision equal to Dr. Talbot's, who would continue the study until sufficient data had been accumulated to establish the general trend of metabolism. This re-

search was projected in 1911 and has been constantly and regularly continued ever since. It concludes on July 1 of this year.\* That results of 8 years of intensive study differ widely from scattered values drawn from the literature is only to be expected.

The popular impression that children for their size eat much larger amounts of food than adults do and engage in relatively larger amounts of muscular activity leads to the question as to whether there is a specific basal metabolism of children measurably different from that of adults. Our studies thus far have enabled us to project a reasonably satisfactory curve for the total metabolism when referred to weight. It will be of considerable importance to compare this with the metabolism of adults, which has been studied quite extensively and recently analyzed in publications from the Nutrition Laboratory.<sup>3</sup> Consequently in Figure 25, beside the curve for the basal calories obtained with boys of increasing weights, we have laid the line found to approximate most closely the relationship between total calories and weight for men. The left hand part of this curve is, therefore, an exact duplicate of Figure 15, while the right is a straight line derived from the analysis of the metabolism of 136 men. This line for men is a singularly interesting continuation of the curve for boys. When the deviations of individual values either side of a straight line for adults are considered, however, too much stress must not be laid upon this, but it is clear that so far as this analysis goes, the metabolism of children follows in a fairly regular line that for adults.

With girls, the comparison with women is made in Figure 26, the left hand portion of which, ranging from 2 to 40 kilograms, is a duplication of Figure 16. The straight line from 36 to 82 kilograms is that representing the general trend of metabolism of adult women based upon the analysis of results obtained with 103 women in the Nutrition Laboratory. The connection between the end of the curve for girls and the beginning of the curve for the lighter women is by no means so regular as was noted with boys. It should be stated, however, that the number of individuals studied at the upper weight limit with girls and the lower weight limit with women is as yet relatively small, and

\* A complete report of the results of this investigation will be given in a monograph to be published by the Carnegie Institution of Washington.

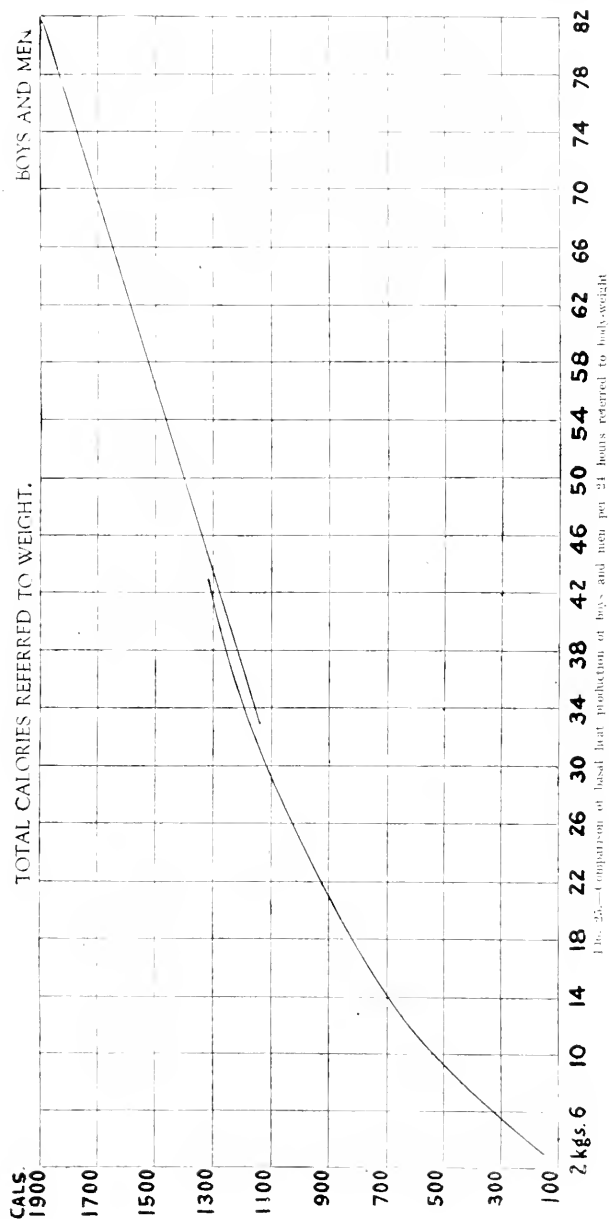


Fig. 25.—Comparison of basal heat production of boys and men per 24 hours referred to body-weight

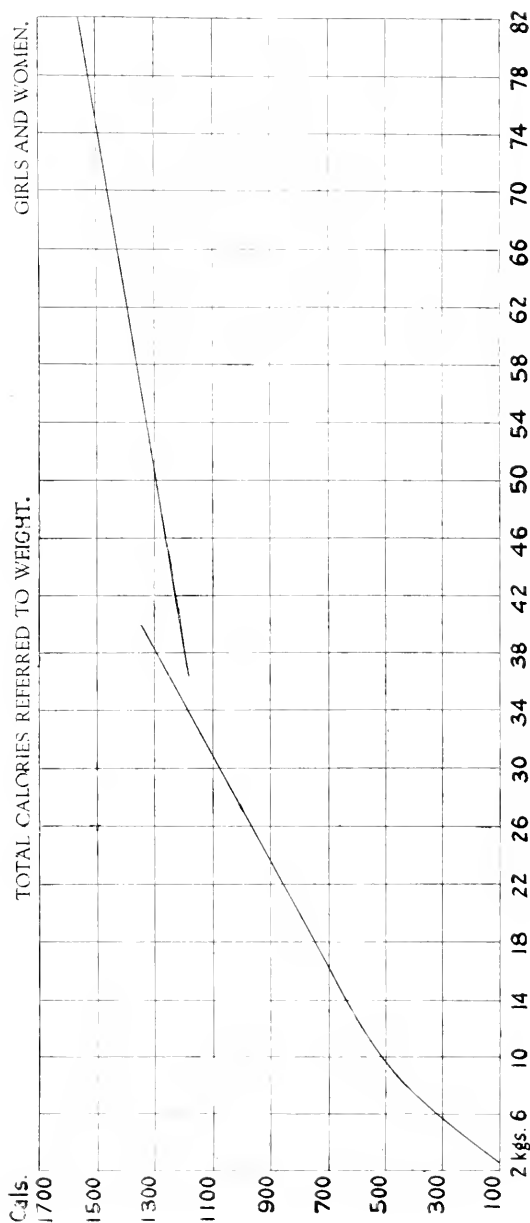


FIG. 26.—Comparison of basal heat production of girls and women per 24 hours referred to body weight.

that further amplification of these data may show better agreement. If, however, the curves were more or less joined and smoothed to give a general trend of metabolism for females from 2 kilograms to 82 kilograms, it would form a curve similar in general appearance to that noted for males. Both the curves for males and for females show that at the lower weight limits we have an increment in metabolism much greater for each 4 kilograms than appears at the larger weights, thus speaking for a greater and more active metabolism per unit of weight with the earlier ages.

From a general inspection of the two preceding charts, no striking difference is to be observed between boys and girls in the general conformity of the lines, but for a true analysis of sex differences in metabolism the curves should be plotted on the same scale and the same chart. This has been done specifically with the total calories referred to weight in Figure 27. Here the dotted line represents the curve for boys and is an exact duplication of the curve in Figure 15, while the solid line is the curve for girls and is that taken from Figure 16. With both sexes no difference is to be observed until about 8 kilograms, when the curve for boys rises perceptibly above that for girls until it reaches 35 kilograms. At this point the curve for the girls rises above that for the boys. Thus, the metabolism of a boy weighing 22 kilograms will, on the average, be about 70 calories per 24 hours greater than that of a girl of the

same weight, while at about 40 kilograms the reverse is true.

The differences in sex as well as differences between youth and adults may best be brought out, however, in comparison curves in which the heat per kilogram of body-weight and the heat per square meter of body-surface are referred to the total weight for both boys and girls and men and women, the latter values being derived from the analysis of the metabolism of men and women previously referred to. In Figure 28 the curves representing the average calories per kilogram of body-weight have been plotted with increasing weights, the broken lines here representing the boys and men and the solid lines the girls and women. The remarkable connection between the first part of the curve representing boys and the latter part representing men, noted in an earlier chart for the total calorie production of the day, is also observed here, and the disagreement between girls and women is likewise here accentuated. The sex differences are not prominent until after about 10 kilograms in weight, when the curve for the boys remains for the most part above that for the girls and that for men is on the average slightly above the curve for women. The line for the girls, which crosses that for boys at 31 kilograms, may possibly be subsequently revised with an extension of observations at or about these weights, for it is clear that between the ages of 12 to 17 years with weights from 30 kilograms to 50 or more kilograms, further ex-

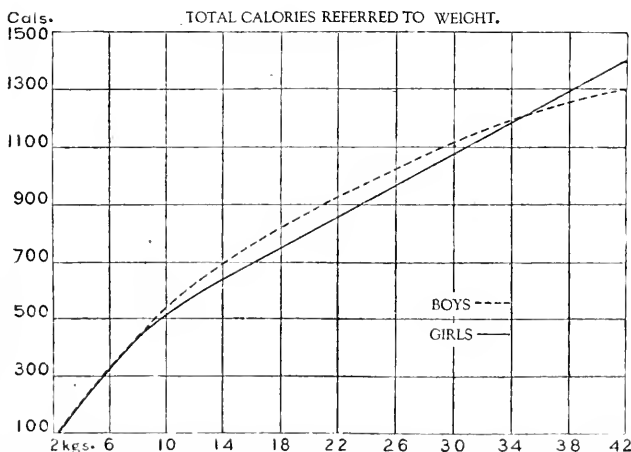
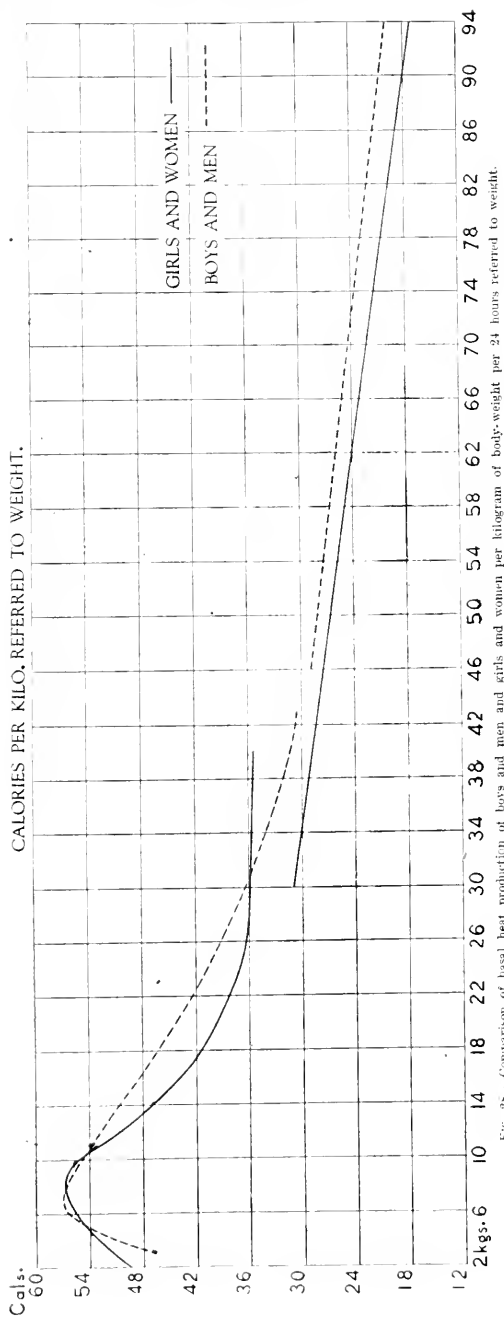


FIG. 27.—Comparison of basal heat production of boys and girls per 24 hours referred to body-weight.





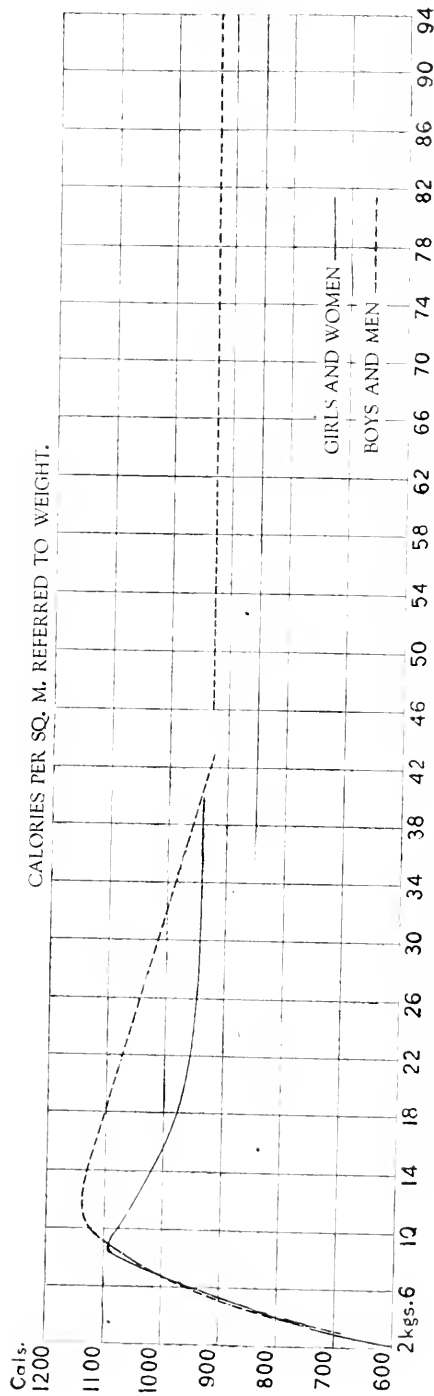


FIG. 29.—Comparison of basal heat production of boys and men and girls and women per square meter of body surface per 24 hours referred to weight.

perimentation must be done. Such experimentation, however, lies outside of the field here discussed, *i.e.*, the metabolism of children, and is a special problem for study by the Nutrition Laboratory in the immediate future.

Finally, referring to the analysis of the heat production per square meter of body-surface with increasing weights, we note in Figure 29 that up to 8 kilograms no differences in the sexes are to be noted, but thereafter the boys have a somewhat higher heat production on the whole, thus indicating a specifically somewhat higher metabolism with the growing boy than with the growing girl. It is perhaps remarkable, with the differences in growing children shown by common observation of the life habits of girls and boys, that no greater difference between the two is to be seen in the *basal* heat production. The value for men lies perceptibly above that for women. Indeed, for weights above 10 kilograms, one might logically state that the average difference between the two sexes was about 75 calories per square meter per 24 hours. As in the other curves, however, the weight-ranges from 30 to 50 kilograms need further study.

This method of comparison is assumed by most physiologists to be freest from criticism and to give identical values for all sexes and ages, but we note from this chart that these assumptions are far from justifiable. After the child's weight has reached 9 kilograms, the metabolism, both per square meter of body surface and per kilogram of body-weight, has a distinct tendency to fall but is perceptibly higher than that found with adults. The metabolism for girls at 9 kilograms is 30 per cent. higher than that for women, and the metabolism for boys at 11 kilograms is 25 per cent. greater than that for men per square meter of body surface and still higher per kilogram of body-weight.

From these charts it is clear that at a very early age, *i.e.*, with low weights, the metabolism is specifically low. It then rises rapidly until the child's weight has increased to approximately 10 kilograms, when it is at its maximum per unit of weight and per unit of area. There is next a steady decrease until approximately 30 to 40 kilograms, when the early adult period begins. In considering these statements, however, it must be borne in mind that in the making of such curves there is danger of misinterpretation as to the fixity of the lines, and it

should be remembered that they represent trends only.

In all of this discussion we have considered only *basal* metabolism. This may seem to thoughtless critics as being a wholly impractical point of view. As a matter of fact, it is of the greatest fundamental interest. The basal metabolism may be, with youth at least, safely compared to that found with the subject asleep, even if the child is not, strictly speaking, in the post-absorptive condition. With the child in bed, resting but awake, the increase in the metabolism will depend entirely upon the activity. We have noted that severe crying increased the metabolism of very young infants 63 per cent. on the average, with a possibility of an increase of over 200 per cent. These factors of course are distinctly problematical. The basal needs are inevitable, and represent a never ceasing 24-hour demand, which is, so to speak, an irreducible minimum. But to supply only the minimum demand for calories in the food would leave the normal child at the end of the day with a large deficit, for the 24-hour demand of the child is made up of minimum or basal demands plus the varying extra demands which are due to several causes. First, food in the alimentary tract of itself stimulates heat production. Energy is further needed to supply the material for growth, this energy being obtained from food. Finally, extra energy is needed for both unproductive and productive muscular activity. If the boy shovels snow, fuel must be supplied to the animal engine for this work. The girl who sweeps or dusts a room needs, as the Nutrition Laboratory has recently shown, approximately 150 per cent. more energy while she is at work than when she is sitting quiet. This factor of the extra energy needs above the basal minimum is one of great variability, most difficult to estimate, and probably much larger than commonly believed. Every one will admit that the growing active boy is a great consumer of food. The popular impression as to the amounts of food so consumed, which seem almost incredible at times, has been fully substantiated by the admirable studies made by Captain Gephart at St. Paul's School in Concord, N. H., in which it was found that the boys averaged 5,000 calories per day.<sup>1</sup> The muscular activity during this period was admittedly excessive.

The intense demand of the active, growing

child for food is evidenced by the constantly increasing habit of supplementing the food obtained at the table by sweets, ice cream, etc. Captain Gephart found approximately 10 per cent. of the total energy obtained by the boys at the St. Paul's School was derived from these sources. So important in the computation of the daily caloric intake have these extra foods become that Mrs. Benedict has been at the Nutrition Laboratory for the past year or two studying directly the caloric content of many of the most commonly consumed extra foods. These have been, in part, reported, and I need but cite the fact that she has found that with an ordinary ice cream soda or "sundae" it is not uncommon to secure 500 calories in one portion.<sup>5</sup> It is not surprising, therefore, that growing children clamor for ice cream cones, doughnuts, and cookies, and are regular patrons of the penny candy counter, the bakeshop, and the soda fountain.

Fortunately the clinician in his estimates of the caloric needs of children has to deal for the most part with the needs of children when moderately quiet and in bed. When a child is very active, it does not, as a rule, need a physician. This is not to be interpreted, however, as disparaging in any sense the careful medical supervision of even so-called "normal" school children. Our analysis of normal versus average and our interpretation of the ideal weights for children lead to the firm conviction that growing children should be supplied liberally with food. It is possible, of course, that when the activity is excessive, there should be some restriction. For there are those who believe that excess activity, even with children, ultimately shortens life. It is still, however, the best practice to give a most liberal diet to children, since the greater part of the evidence on underweight indicates that children usually receive too little rather than too much food. I feel that the question as to whether or not the active growing child can have too much food need not seriously trouble any one. Conservation of food as a war measure, is, happily, a thing of the past. Still, let the obese epicure save all the food he can. Let the over-fed dame of leisure curtail her supply. Both are justifiable on hygienic and, indeed, on real actuarial bases. But further evidence must be forthcoming before nutrition experts will agree on any curtailment of the food intake of active growing children, unless possi-

bly (and God forbid) a new war-need should arise.

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## Original Articles.

### NUTRITION CLINICS AND CLASSES: THEIR ORGANIZATION AND CONDUCT \*

BY WILLIAM R. P. EMERSON, M.D., BOSTON.

ALL children of pre-school and school age may be divided, for the sake of discussion, into three groups: the sick, the well, and the malnourished. The sick are cared for at home and in the hospitals. The well are inspected and receive a certain amount of preventive care from school physicians. The malnourished, about a third of all, receive no treatment for their malnutrition as such, because they are considered well by both private and school physicians. These under-par children make it impossible for the schools to reach reasonable standards of achievement. At the same time the system of school organization compels the teacher to attempt to crowd the pupils through the various grades at high pressure, thus adding to the burden of the under-developed and delicate child. As a result, 20% to 40% of those graduating from elementary schools are physically unfit.

It is remarkable that this group of children has received so little medical attention. They pass through hospital clinics unnoticed because malnutrition among older children is not considered a pathological condition.

#### WEIGHING AND MEASURING.

The simple procedure of weighing and measuring each child will identify all but the borderline cases. All children habitually 7% or more underweight for their height are not only undernourished but malnourished, retarded in both weight and height from one to four years.

#### NUTRITION CLINICS.

The object of the nutrition clinic is to identify this group of children and then, on the basis

\* Read at the International Child Welfare Conference, called by the Secretary of Labor, Washington, D. C., May, 1919.

of physical, mental, and social examinations, to make a diagnosis of the cause of the malnutrition, thus leading to its proper treatment. It is of as much importance to make this accurate diagnosis in malnutrition as it is in other illnesses. It would be absurd for a physician to ask a group of nurses to care for a ward filled with patients affected with various diseases without informing them of the diagnosis in each case. Yet we are asking school nurses, health workers, and parents to carry out general directions with practically no attempt at diagnosis, resulting in an enormous waste of time, energy, and expense. The nutrition clinic corrects all this by determining the cause of the malnutrition in each instance and then indicating measures for its treatment.

*Physical and Mental Examinations.* The physical examination reveals an average of more than five defects for each child. When defects interfering with nutrition, especially obstructions to breathing, are corrected, the child is considered free to gain. The mental examination is made in most instances during the course of the physical examination, when it is determined whether there is any question of mental deficiency or retardation. An essential part of the mental examination is to learn the child's disposition and reaction to his environment.

*Social Examination.* The home life of the child is investigated by a 48-hour record of his program, which includes a list of food taken during that time, his hours of sleep, of work, of play, time in the open air, and, in fact, all his various activities.

Simple causes, as the following, are found adequate to explain malnutrition of the most severe type: fast eating, insufficient food, the use of tea and coffee, late hours, closed windows at night, too little time in the open air, poor hygiene, over-pressure and long hours in school. Such definite diagnoses are essential to successful treatment.

#### NUTRITION CLASSES.

Having then found the causes of the malnutrition by means of these physical, mental, and social examinations, it requires the co-operation of the child, physician, teacher, and parent to remove them and at the same time to secure for the child the essentials of health. These essentials are the removing of physical and mental

causes of poor nutrition, getting the children to take sufficient and proper food at frequent intervals, securing fresh air by day and night, preventing over-fatigue, and establishing sufficient home control to insure good food and health habits. If these results are accomplished, the child should rapidly gain weight and become well and strong, *because of a powerful force in Nature that makes for health.*

*Preparation for the Class.* Coöperation for the essentials of health is best obtained by means of nutrition classes of not more than twenty children in each. The nutrition worker prepares for the class by the weekly weighing of each child and the recording of this weight on a chart. The charts show the average weight line corresponding to the child's height, and also his actual weight line as he gains or loses. The worker also checks up the diet lists, which are carefully kept by pupil or parent in a small record book for two consecutive days of each week. On these days each article of food taken is recorded, the amounts are indicated in tablespoonfuls or ounces. At this time errors in diet should be corrected and helpful suggestions made, especially in regard to taking milk and cereals. The 24-hour amount should be large enough for gain, usually 2000 or more units (calories). A blue star is given for rest periods and a red star for lunches, if each has been taken every day of the preceding week. In case of failure to gain, personal conferences are held with each pupil in order to discover an adequate cause, which always exists, and therefore should be found by either the nutrition worker or the physician.

*Class Conduct.* The charts having thus been prepared, the children are assembled by the nutrition worker in a room by themselves, where two rows of seats are arranged, ten seats to each row. The child gaining most is given a gold star and placed at the head of the class. The other children are arranged in order of their gain. The weight chart of each child is hung opposite his place in the class. The nutrition worker keeps a history and record card of each child, which contains the doctor's directions and her follow-up notes. These cards are used by him in considering each child.

When the class is in order the doctor conducts the exercise in such manner as to leave a clear idea in the mind of each child as to what he is to do the following week that he may gain.

The room should be quiet and free from interruptions. Parents should occupy the back seats but the teacher and nutrition worker should be seated in front where they may show by their attention lively interest in each child's progress. The physician praises the children who have gained, but it is his special duty to discover the causes for loss in those who have not gained. These causes are usually failure to take regular lunches or rest periods, fatigue, late hours, etc. This gives an opportunity to show the importance of these factors in the gain or loss of the particular child. A half hour is sufficient time for the physician to take for this exercise. The nutrition worker makes notes and explains the recommendations to each child or parent. Usually the child losing one week is at the head of the class the following week. Where there is complete coöperation and the essentials of health can be wholly obtained, the child should reach his own normal standard of weight in ten or twelve weeks. From 5% to 10% of the children present serious medical problems requiring most careful study by the physician. Even in these cases, however, the class method provides the most satisfactory method of treatment.

*Coöperation with the Home.* The nutrition worker should visit the child in his home in order to gain the coöperation of his parents and to learn his health habits, especially with reference to eating and sleeping. Plans should be made for open windows at night and plenty of time in the fresh air by day.

*Prevention of Over-fatigue.* During the period of treatment, the children should be placed in open-air, or at least open-window, classes and school pressure should be reduced. Some children will need only sufficient additional time for rest and lunch periods; many will work to best advantage on a half-day schedule; a few will need to be reduced to two hours a day, while certain cases cannot profitably attend school at all for a time. One rest period of at least half an hour should be taken before the mid-day meal. The child should lie flat on his back, thus correcting his usual fatigue position of stooping shoulders, retracted chest, and prominent abdomen. In the mid-afternoon a similar rest period should be taken but for a longer time.

*Food.* Mid-forenoon and afternoon lunches should contain about 250 units of such food as will

not destroy the appetite for the following meal. Sweets should be avoided at this time. *Children gain faster on less food taken in small amounts five times a day than when a larger amount of food is taken in three meals.*

*Authority of the Class Method.* The class method appeals to the imagination of the child and makes him do for himself what no one else can do for him. It teaches and inspires him to "train for health" in the same way he trains to be a Boy Scout or a good athlete. Therefore ask him what you will and he will do it cheerfully if he is convinced it is good "dope." The boy of seven or eight years steals off by himself, wraps up in his blanket, and takes his rest periods, or teaches himself to take and to like foods to which previously he had an aversion. He stops drinking tea and coffee, goes to bed early, prepares his bed with hot water jug and papers between blankets, that he may sleep with his windows open on the coldest night. All this he does that he may see his weight line go up each week and the stars registered on his chart.

Successful treatment in the majority of cases is both easy and sure, provided either the physician, nutrition worker, or teacher has sufficient vision to paint true pictures in the child's imagination, thus securing his complete coöperation.

## Book Review.

*Paper Work of the Medical Department of the United States Army.* By RALPH W. WEBSTER, M.D., PH.D. Philadelphia: P. Blakiston's Son & Company, 1918.

The medical officer in carrying out his administrative duties is confronted by many varieties of papers, which, if he is unacquainted with military regulations interfere with the efficient conduct of his daily work. This volume, "Paper Work of the Medical Department of the United States Army," brings together the most important papers which members of the Medical Reserve Corps especially will find of great value in matters of daily routine. Illustrations and explanations are given of papers pertaining to the recruit, to the company or detachment, to medical organizations and hospitals, and to the higher administrative offices. The author has endeavored to incorporate in this volume all the information available on these subjects.

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## ENERGY REQUIREMENTS IN HUMAN NUTRITION.

For ten years, the Nutrition Laboratory of the Carnegie Institution of Washington has been conducting investigations to determine standard bases of comparison in human nutrition. A recent issue of *Science* contains an article by Dr. J. Arthur Harris and Dr. Francis G. Benedict, describing the research work of this institution on this subject. This is a problem of great practical importance, inasmuch as industrial efficiency and physical well being are dependent upon a knowledge of the amount and kind of food required by the individual.

In a problem of this sort, it is necessary to consider the characteristics of human individuals. Muscular work requires more food supplying energy than less active occupations, and it is probable that an older person requires less food than a younger one. In order to make investigations on this subject of practical value,

they must be expressed in a quantitative form, in calories per unit of time.

The measurement of the amount of oxygen consumed and the quantity of carbon dioxide excreted from the lungs furnishes an index of heat production, or the setting free of energy in the human body. There are two methods by which this may be computed—either by means of a calorimeter or by measuring gaseous exchange in a respiration chamber. Lavoisier, Rubner, Zuntz, Atwater, Rosa, Lusk, and DuBois have made experiments in the development of apparatus for the measurement of both heat production and gaseous exchange.

Besides physical and chemical elements, biological factors must also be considered. It is now possible to measure the energy transformation required in muscular activity. It has been generally agreed by physiologists that heat production at complete muscular repose and in the post-absorptive state be called the basal metabolism and made a standard of comparison in investigating problems of human nutrition. Investigations have been made by the Nutrition Laboratory on one hundred and thirty-six men, one hundred and three women, and ninety-four new born infants. These experiments have shown that basal metabolism is variable and not wholly independent of bodily dimensions; yet, although the metabolism of men of any stature is highly variable, there is a tendency for taller men to show greater daily heat production. Experiments tend to show that the coefficients measuring the relationship between body weight and metabolism are in all cases higher than those between stature and metabolism, and that the body mass is a more important factor in determining the basal daily heat production of the individual than is a linear bodily dimension such as stature. The question then arises, whether the greater heat production of tall individuals may not be merely the resultant of the relationship between stature and weight on the one hand and weight and metabolism on the other. In this connection, the results given in this article show that both stature and body weight have independent significance in indicating daily heat production. This fact is of great importance, as it underlies the determination of the best formulae for the prediction of the basal metabolism of the individual.

The results of investigation of the relationship between metabolism and age are of importance

not only to the clinician, but also to the biologist in their bearing upon the general problem of senescence. It has been shown by linear equations that basal metabolism decreases with age during the period of adult life. In men, the daily heat production decreases about 7.15 calories, and in women, 2.29 calories per year.

The practical significance of the formulæ presented in this article may be tested by applying them to the clinical investigation of the influence of some disease, diabetes, for example, on the metabolism; for by comparing the caloric output of the subject in a pathological state with normal metabolism, conclusions can be drawn in regard to the influence of the disease.

The study of basal metabolism of large numbers of individuals in good health and living under normal conditions furnishes a valuable standard of comparison in the investigation of the special problems of energy requirements in human nutrition. The work of these investigators in determining proper biometric constants and equations should be appreciated, inasmuch as they have contributed knowledge which will be of great value in maintaining the industrial efficiency and physical energy of the nation.

#### THE ROCKEFELLER FOUNDATION.

A REVIEW of the work of the Rockefeller Foundation for the year 1918 has been published recently by George E. Vincent, president of the Foundation. Through its own departments and by coöperation with seventeen independent agencies, the Foundation has conducted campaigns against disease and has assisted the advance of medical education.

The Foundation's Commission for the Prevention of Tuberculosis in France, under the leadership of Dr. Livingston Farrand, found upon arriving in the land of Louis Pasteur that there was already in existence almost every effective agency known to modern medicine and public health administration in combating consumption. The theory and the principles which underlie the control of tuberculosis, the organization and administration of dispensaries and sanatoria, and the organization of local communities, relief measures, and educational work was thoroughly understood by French scientific men.

There appeared to be, however, one contribution which the American Commission could contribute to the control of tuberculosis in France. The various institutions already existing were isolated and unrelated, and there was no efficient, coöperative, centralized organization for a united, comprehensive attack on tuberculosis. It was in the introduction of organized team play that the American Commission proved to be most valuable. The Nineteenth Arrondissement in Paris and the Department of Eure-et-Loir of the provinces were selected for the demonstration of American methods.

A group of American nurses who could speak French fluently were secured, and centers were organized in Paris where French nurses could take special courses. The medicinal "Tank," an invention of the Rockefeller Foundation, entered French villages and cities and introduced public health education by means of lectures, posters, advertising, and demonstrations. Efforts were made to extend health work in 27 departments by organizing local communities to establish dispensaries; by the end of the year, 57 new dispensaries had been opened, two others were being installed, and plans for 49 more had been definitely laid. Arrangements were made also for 15 laboratories. Almost the entire expense, both for the creation and for the maintenance of these activities, were borne by the French people. At the present time, an effort is being made to establish a complete system of dispensaries of the Région du Nord. It is expected that when the Commission withdraws from France, this work will continue and a nation-wide system for combating tuberculosis, will become a permanent part of the policy of France.

The work of the Rockefeller Foundation in the control of malaria has been continued during 1918. As an example of its effectiveness, it may be mentioned that in Hamburg, Arkansas, the number of malaria cases has dropped from 2,312 in 1916 to 58 in 1918.

The investigation of yellow fever has been under the direction of General William C. Gorgas, who made a preliminary journey to Central America before the end of 1918. When a yellow fever epidemic was reported in Guatemala in June, 1918, by permission of the Guatemalan Minister in Washington, Dr.

Joseph H. White was sent to Guatemala and received the necessary authority and aid for carrying on his work. The epidemic was brought under control, and on December 4, it was reported that no yellow fever remained in Guatemala. A commission of five men sent to Guayaquil, Ecuador, to stay for two months, secured important information concerning the bacteriological, chemical, and clinical aspects of yellow fever.

The progress made by the Foundation in the control and prevention of hookworm infection has been considerable. Infections surveys have been made to determine the prevalence of the disease, intensive demonstrations of treatment have been made, educational campaigns have been conducted, and persistent efforts have been made to secure the provision of proper sanitary facilities and regulations. During 1918, work for the relief and control of hookworm disease was carried on in coöperation with twelve states in the United States and with twenty-one foreign states and countries.

In the interest of preventive medicine, the Rockefeller Foundation established the School of Hygiene and Public Health in October, 1918, under the auspices of the Johns Hopkins University in Baltimore. This school will provide thorough courses in the fundamental chemical, biological, and medical subjects in specialized phases, and will, in addition, emphasize the importance of vital statistics, sanitary engineering, the sociological aspects of public health, community surveys, and the technique of administration.

The plans of the Foundation for future development of public health control and medical education in foreign countries are extensive. Physicians and medical students will come from Brazil, China, and France to study, with the aid of Foundation fellowships, in leading medical schools in the United States. Work on the construction of the fifteen buildings of the Peking Union Medical College has been continued during the year, although there have been inevitable delays due to difficulty in securing materials from the United States. The pre-medical school, which opened in 1917 with eight pupils, increased its enrollment in 1918 to 17. Plans have been made for another building at Shanghai. During 1918, the China Medical Board gave aid to one or two medical schools and to 19 hospitals which are conducted

in China under the auspices of several missionary boards. Medical education in South America has been advanced by the organization of a new Department of Hygiene in connection with the *Faculdade de Medicina e Cirurgia* at Sao Paulo. In 1918, a total sum of \$55,000 was expended for fellowships and scholarships to students from foreign countries or to American missionaries at home on furlough.

Among other fields of usefulness the Foundation has assisted the Rockefeller Institute for Medical Research; it has made possible, by appropriations, studies in mental hygiene, infantile paralysis, public health nursing, and industrial relations. The total expenditures of the Foundation for war purposes,—for camp and community welfare, medical research and relief, and humanitarian aid,—amounted to \$22,444,815. These activities of the Rockefeller Foundation are consistent with its program, which has for its dominant purpose the promotion of the welfare of mankind throughout the world.

#### MEDICAL NOTES.

THE LISTER INSTITUTE.—The activities of the Lister Institute during the past year have been outlined in a recent issue of *Science*. This Institute, unlike other medical organizations in London, is an independent organization endowed by private benefactors. The staff of the Institute has devoted considerable time during the year to bacteriological examinations for the London County Council and other public bodies, and to the production of serums and vaccines for the War Office and the Government of Egypt. Research investigations have been made on the virus of trench fever and typhus fever, and the transmission of these diseases by lice, on anaerobic bacteria of wounds and the preparation of standard samples of the toxin of *Vibrio septique*, on the properties of accessory food factors and the effects of the deprivation of them on the various animals, and, at the request of military authorities, research has been conducted to determine the cause of surry.

HONOR FOR DR. W. J. HOLLAND.—Dr. W. J. Holland, director of Carnegie Institute, Pittsburgh, has been honored by having conferred



upon him the title of Commander of the Order of the Crown of Belgium in recognition of his services to that country.

**NOMINATION OF DR. ALEXANDER C. ABBOTT.**—Dr. Alexander C. Abbott, who has been serving with the United States Medical Corps, has been nominated for a position on the Philadelphia Board of Health.

**CANCER MORTALITY RATES.**—A recent issue of *Campaign Notes*, issued by the American Society for the Control of Cancer, comments upon the cancer death rate in Great Britain and the United States. It has been observed that in England and Wales the cancer death rate has shown a decided increase during the war; but it is believed that this may be accounted for by the fact that so large a proportion of the male population has been removed to France and Belgium, leaving only the older age groups, in which cancer is naturally much more frequent, at home. During the war the rate for cancer mortality has greatly increased among males, but there has been little change among females. For the three years preceding the war, the cancer death rate among men was 91 per 100,000 of population; in 1916, 96 per 100,000; in 1917, 93 per 100,000. The rate for the same period before the war among 100,000 women was 99; in 1916, 101; in 1917, 100.

In considering the relative prevalence of cancer in any particular locality, it is necessary to take into account the age distribution of the population. In this country, Vermont has the highest cancer death rate, the figures reaching 108.9 in 1914, while the rate in Utah was only 45.6. It is probable that this may be explained by the fact that the present inhabitants in Vermont are chiefly within the older age groups, while the young people have largely emigrated to the industrial centers of other states.

**AN ACTIVE CENTENARIAN.**—Mrs. George DeBeek, the oldest resident of British Columbia, celebrated her 105th birthday on June 27 at her home in Marpole. She was born in St. Johns, N. B., in 1814, and went to the Pacific Coast about 50 years ago. Mrs. DeBeek has over 100 direct descendants, including her children, grandchildren, and her great-grand-

children. Of her own twelve children, only five are now living. Despite her extreme age, Mrs. DeBeek is still active and retains all her faculties to a remarkable degree. During the war, she assisted in war work, knitting many pairs of socks for the soldiers.

**OUT-PATIENT CLINICS FOR MENTAL DISEASE AND DEFECT.**—There has been published recently a list of 39 neuro-psychiatric out-patient clinics in Massachusetts for the examination and treatment of mental disease and defect. This list has been prepared by the Massachusetts Society for Mental Hygiene for the information and convenience of physicians, judges, school authorities, Red Cross workers, district nurses, social service workers, and others, as well as for the growing number of voluntary patients seeking the aid of qualified experts. This list may be of interest to discharged soldiers who are suffering from war neuroses and who may desire to select the clinic nearest their homes for advice and treatment.

**MEETING OF NEW YORK PHYSICIANS.**—At a meeting of prominent physicians and surgeons in New York recently, the New York Association for the Advancement of Medical Education and Medical Science was organized. It is reported that Dr. Royal S. Copeland announced plans for the erection of a \$50,000,000 medical college in New York, in order to provide better facilities for medical instruction, both graduate and under-graduate. The object of the association will be to establish a working affiliation of the medical schools, hospitals, laboratories, and public health facilities of the city and to create a "medical educational foundation" to finance medical education and investigation.

Dr. Wendell C. Phillips was elected president of the association; Dr. George D. Stewart, vice-president; Dr. Haven Emerson, secretary. A board of fifteen trustees will manage the institution, with the mayor, commissioners of charities and health, and the president of Bellevue and allied hospitals *ex-officio* members of the board.

**GERMS AND DISEASE.**—Dr. H. A. Zettel of St. Paul and Dr. H. W. Hill, executive officer of the Minnesota public health association, have agreed to expose themselves to contagious dis-

case germs, including typhoid, smallpox, and bubonic plague, in support of their contradictory theories. Dr. Zettel, believing that germs do not cause disease, will use in his defence against the germs only sanitation, pure air, and sanitary food and drink. Dr. Hill will expose himself after scientific inoculation and vaccination. The two doctors are to expose themselves simultaneously to the same diseases and will then enter quarantine to await the result.

Dr. Hill was bacteriologist in Boston from 1898 to 1905 and was for a number of years director of the bacteriological laboratory of the Boston board of health. He resigned in 1905 to assume the position of assistant director of the Minnesota state board of health laboratory and assistant professor of bacteriology of the University of Minnesota.

CONFERENCE ON RECONSTRUCTION IN LONDON.—A conference was held in London from June 25 to June 28 for the purpose of considering problems of reconstruction. The subjects were considered under the following heads: The Work of the Ministry of Health; The Prevention and Arrest of Venereal Disease; Housing in Relation to National Health; Maternity and Child Welfare; and The Tuberculosis Problem under After-War Conditions.

PEKING UNION MEDICAL COLLEGE.—The Peking Union Medical College, Peking, China, will be open for the instruction of students in October, 1919. The school has been built under the direction of the Rockefeller Foundation, and will be open to both women and men. A pre-medical school offering a three years' course was opened in 1917.

PROMOTION OF FREDERICK L. BOGAN.—Major Frederick L. Bogan, M.R.C., has been promoted to the rank of lieutenant-colonel in the Medical Reserve Corps of the United States Army. During the war, Major Bogan has rendered distinguished service as commander of the 102d Field Hospital of the 26th Division. While in service in the Toul sector, he devised a medical instrument for the registration of blood pressure which proved of great value in the treatment of sick and wounded soldiers, and was later placed in the Army Medical museum at Washington.

MEDICAL SOCIAL WORK FOR NURSES.—A spe-

cial course has been arranged by the Public Health Service, in coöperation with Columbia University, Bellevue Hospital, and the New York School of Social Work, for instructing graduate nurses in medical social work. The American Red Cross has provided fifteen scholarships for this work. The course opened on July 1, and will continue for about four months: its purpose is to offer to qualified women a view of the social problems implied in the control of venereal diseases. Speakers for the course have been chosen for their special study of individual aspects of the problem. Students will attend certain lectures at the regular course at Teachers College, as well as the special lectures on the study of the causes, social and economic, of venereal diseases, including racial tendencies, conditions in home and family life, defective education, the nature of recreation and diversions offered for the leisure of young people, personal and community standards, conditions of country and city, and the problems of adolescence, low mentality, drug taking, and alcohol.

The course will also consider the problems of control and prevention of venereal diseases by administrative and educational means. The closing weeks of the course will be spent in the study of social service in the clinics of Bellevue Hospital.

Further information concerning this course may be had from Assistant Surgeon General C. C. Pierce, Division of Venereal Diseases, United States Public Health Service, 228 First Street, N. W., Washington, D. C.

BRITISH BIRTHDAY HONOURS LIST.—*The British Medical Journal* has published recently from the Birthday Honours List some interesting announcements of the recognition of the services rendered during the war by temporary and territorial medical officers.

The K.C.B. is conferred on Sir Anthony Bowlby, who has been consulting surgeon at General Headquarters in France since 1914. The K.C.M.G. is conferred also on Major-General Sir Wilmot Herringham, who served as consulting physician at various times of the First, Third, and Fourth Armies, and was at Headquarters during the greater part of the war; on Major-General Cuthbert Wallace, who was consulting surgeon with the First Army throughout; on Colonel W. T. Lister, who was

ophthalmic specialist with the armies in France; and on Major-General Richard H. Luce, C.B., of Derby, a territorial medical officer of long standing, who was D.D.M.S. of the Eastern Force. Among officers of the Australian Army Medical Corps honored are Sir Neville R. House, V.C., K.C.B., Director of Medical Services, and Colonel Henry C. Maudsley, of Melbourne, who served in Europe throughout the war; both receive the K.C.M.G. Surgeon-General Charles S. Ryan, C.B., Consulting Surgeon to the Australian Force, receives the K.B.E. The same distinction is conferred upon a number of consulting officers of the Territorial Force who served chiefly in this country; among them are Colonel Henry Davy, C.B., of Exeter, who has been consulting physician in the Southern Command; Lieut.-Colonel D'Arcy Power; Colonel Hamilton A. Ballance, C.B., of Norwich; Colonel Charters J. Symonds, C.B., Sir Arthur W. Mayo-Robson, who have been consulting surgeons of the Southern Command; on Sir Robert Jones, C.B., Inspector-General of Military Orthopaedics; on Lieut.-Colonel Sir Shirley F. Murphy, who placed his immense knowledge of London sanitary administration at the disposal of the London Command; on Colonel G. Sims Woodhead, Professor of Pathology in the University of Cambridge; on Lieut.-Colonel Douglas Reid, C.M.G., of St. Thomas's Hospital, who has been President of the War Office X-Ray Committee; and on Lieut.-Colonel F. W. Mott, F.R.S., whose work at the Maudsley Military Neurological Hospital has been of great value.

The medical staff of the British Forces in Italy is honoured in the person of Major-General F. R. Newland, C.B., who was D.M.S., and receives the K.C.M.G., and Colonel C. Gordon Watson, C.M.G., who receives the K.B.E. The same distinction, conferred on Colonel H. M. W. Gray, C.B., of Aberdeen, will give great pleasure to those who served with him in the Third Army in France and afterwards when he came home to work with Sir Robert Jones in the department of military orthopaedics. Among the regular officers honoured are Lieut.-General Sir William Babbie, K.C.M.G., who receives the K.C.B.; Major-General Harry N. Thompson, who was D.M.S. of the First Army and is now D.M.S. of the army on the Rhine, who receives the K.C.M.G.; and Major-General G. B. Stanistreet, C.B., Deputy Director-General at the War

Office, and Colonel R. H. Firth, C.B., an authority on general as well as military hygiene, who received the K.B.E. The distinction of C.B. is conferred on Colonel William Taylor of Dublin, one of the consulting surgeons to the forces.

Of the civil honours conferred we may note the knighthoods to Dr. John Baker, Superintendent of the Broadmoor Lunatic Asylum, and to Dr. Douglas Shields, a Melbourne graduate who has been senior surgeon to the Officers' Hospital, Park Lane, London, during the war, and the C.B. to Dr. R. W. Branthwaite, one of the Commissioners of the Board of Control.

**RESOLUTION OF THE AMERICAN MEDICAL ASSOCIATION.**—In order that the health of communities may be safeguarded, the prompt reporting by physicians of cases of communicable diseases is necessary. In order to support this law and public health work, at a recent meeting at Atlantic City, the Section on Preventive Medicine of the American Medical Association passed the following resolution:

*Resolved*, That the Section on Preventive Medicine and Public Health of the American Medical Association recommend to the House of Delegates that it ask the constituent associations to consider the advisability of such amendments to their by-laws and to those of this association as will eliminate from membership any physician who wilfully fails or refuses to comply with local or State laws for the prevention of disease, including especially the provisions in such laws requiring the reporting of cases of communicable disease.

This resolution indicates the purpose of the American Medical Association to insist that members of the Association perform faithfully the duties of a physician, not only to his patients but also to the public at large.

**BIRTH STATISTICS AND INFANT MORTALITY.**—A recent Public Health Report states that in the birth-registration area of the United States 1,353,792 infants were born alive in 1917, representing a birth rate of 24.6 per 1,000 of population. The total number of deaths in the same area was 776,222, or 14.1 per 1,000. The births exceeded the deaths by 74.4 per cent. For every State in the registration area, for practically all the cities, and for nearly all the counties, the births exceeded the deaths, in most

cases by considerable proportions. The mortality rate for infants under 1 year of age averaged 93.8 per 1,000 living births.

The birth rate for the entire birth-registration area fell below that for 1916 by two-tenths of 1 per 1,000 population; but the death rate was less by six-tenths of 1 per 1,000 than in 1916.

**GIFT TO WASHINGTON UNIVERSITY SCHOOL OF MEDICINE.**—A grant of five thousand dollars has been received by the Washington University School of Medicine for the purpose of investigating hypertrichiasis. The work will be conducted chiefly in the fields of anthropology and heredity.

**UNIVERSITY OF NEBRASKA.**—The will of the late Clementine C. Conkling has provided that real estate in the city of Omaha, to the approximate value of twenty-five thousand dollars, be bequeathed to the College of Medicine, University of Nebraska, Omaha.

**CHAIR OF BACTERIOLOGY.**—We learn from a recent issue of *Science* that the sum of £15,000 has been offered to the London Hospital by the Goldsmith's Company for the endowment of a chair of bacteriology, to be known as the Goldsmith's Company chair of bacteriology.

**MEDICAL CONFERENCE AT MILAN.**—At a conference held recently at Milan, Professor F. Mariani considered various problems relating to conditions of the heart. He discussed the resistance of the cardiac muscle, the importance which one should attach to the defects of the orifices, and to the functional conditions of the muscular fibre of the heart. He illustrated by x-ray pictures the heart and the aorta, and discussed the importance of new studies on the primitive bundle for the pathogenesis of arrhythmias. In speaking of treatment, Mr. Mariani first illustrated auricular insufficiency and the pathogenetic treatment of arrhythmias, then the insufficiencies of the left ventricle in a state of hypertension, and finally, the insufficiency of the right ventricle, which he divided into three categories: absolute insufficiency, evident, relative insufficiency, and latent relative insufficiency. He illustrated the great advantages which can be obtained in these forms by Swedish physical treatment,—either passive in the serious conditions, or progressively resist-

ant to educate the heart and increase the forces of resistance and reserve.

Mr. Mariani expressed his belief that the example of Milan should be followed in other medical centres in order to make available to all physicians the current scientific information about conditions of the heart.

**UNIVERSITY OF BUFFALO ALUMNI ASSOCIATION.**—At the annual business meeting of the Alumni Association of the Medical Department of the University of Buffalo, the following officers were elected for the ensuing year:

President, John A. Stapleton; First Vice-President, Charles B. Kibler; Second Vice-President, William C. Heussy; Third Vice-President, James H. Carr; Fourth Vice-President, Mary O'Malley; Fifth Vice-President, John C. Lappeus; Secretary, A. H. Aaron; Treasurer, Harry N. Feltes; Trustee, William F. Jacobs; Chorister, Norman L. Burnham; Chairman of Executive Committee, Harry R. Trick; Executive Committee, Theodore M. Leonard, Henry J. Mulford.

**RETURN TO UNITED STATES OF BASE HOSPITAL No. 21.**—With the cessation of hostilities the work of the overseas medical units, though considerably lessened, was far from completely finished and has required in many instances the retention for several months longer of a large part of the enlisted personnel. Among the recent arrivals in the United States, after twenty-three months of successful service, was Base Hospital No. 21, made up of the faculty of the Washington University School of Medicine, St. Louis, which landed in New York on April 20, 1919. This unit, commanded at first by Major Fred T. Murphy and later by Lieutenant-Colonel Borden Veeder, was in the first thousand troops to go overseas from the United States. During the eighteen months of their stay in Rouen, the members of this Unit took care of over 62,000 patients. For a considerable portion of its service, Base Hospital No. 21 was attached to the British forces, and part of the Unit, under command of Major W. B. Clopton, took part in the St. Mihiel and Argonne engagements as Mobile Hospital No. 4. Base Hospital No. 21 established for itself a splendid record and many of its members were selected for special work. Lieutenant-Colonel Walter Fischel was in charge of the medical service;

Miss Jane Stinson became head of the Nurses' Corps of the American Expeditionary Forces and has remained in France; Colonel Nathaniel Allison was appointed orthopedic consultant of the American Expeditionary Forces. Major Sidney Schwab was placed in charge of Hospital No. 117 for war neuroses. Colonel Opie was detached for coöperative work with Colonel Strong in his trench fever research, and later was placed in charge of the pneumonia command in the Surgeon-General's office. Colonel Murphy later was appointed medical and surgical director of the American Red Cross in France.

#### BOSTON AND MASSACHUSETTS.

**WEEK'S DEATH RATE IN BOSTON.**—During the week ending July 5, 1919, the number of deaths reported was 155 against 201 last year, with a rate of 10.15 against 13.36 last year. There were 21 deaths under one year of age against 28 last year.

The number of cases of principal reportable diseases were: Diphtheria, 45; scarlet fever, 27; measles, 33; whooping cough, 20; tuberculosis, 41.

Included in the above were the following cases of non-residents: Diphtheria, 2; scarlet fever, 1; tuberculosis, 3.

Total deaths from these diseases were: Diphtheria 1; whooping cough, 1; tuberculosis, 15.

Included in the above were the following non-residents: Diphtheria, 1.

During the week ending July 12, the number of deaths reported was 218 against 210 last year, with a rate of 14.28 against 13.96 last year. There were 27 deaths under one year of age against 39 last year.

The number of cases of principal reportable diseases were: Diphtheria, 41; scarlet fever, 22; measles, 24; whooping cough, 12; tuberculosis, 31.

Included in the above were the following cases of non-residents: Diphtheria, 5; scarlet fever, 6; tuberculosis, 5.

Total deaths from these diseases were: Diphtheria, 4; measles, 1; whooping cough, 4; tuberculosis, 25.

Included in the above were the following non-residents: Tuberculosis, 1.

**HEALTH REPORT OF WORCESTER**—The annual report of the Board of Health of Worcester,

Massachusetts, records the vital statistics, complaints, and communicable diseases of the past year. The total number of deaths throughout the year was 3,759, or a mortality of 20.5 per thousand the largest in the history of Worcester. With the exception of deaths from influenza and pneumonia, the death rate was unusually low; excluding deaths at both State hospitals, it was 18.27; excluding non-residents, it was 17.4.

The Bacteriological Department has examined 2,885 cultures of diphtheria, 1,180 specimens of sputum, 118 Widal tests for typhoid bacilli, and four malaria tests. There were reported during the year, 168 cases of scarlet fever, 25 of typhoid fever, 166 of diphtheria, 336 of pulmonary and laryngeal tuberculosis, and 6,884 of influenza and pneumonia. Two hundred and eighty-five persons were vaccinated by the Department. A total number of 1,459 visits were made by the school nurses during the year.

The report of the Belmont Hospital shows that a total of 529 patients suffering from scarlet fever, diphtheria, and influenza were admitted during the year. In Putnam Ward for advanced tuberculosis, 225 patients were treated, and 79 patients were registered in the Out-Patient Department.

**RHEIMS HOSPITAL FUND.**—The Boston endowment fund for beds in the Rheims Hospital, established by the New England Branch of the American Fund for French Wounded, is now complete. The fund has reached a total amount of \$151,923.60.

**BROCKTON INFANT MORTALITY RATES.**—The infant mortality rate in Brockton is unusual, for the fact that the rate for the native group is 101.5 and for the foreign group, 92. An investigation has been made to discover the effect upon infant mortality of various economic, social and physical factors. Comparison of the differences in infant mortality rates between the children of the native and foreign born in other cities serves to emphasize the peculiar record of this manufacturing community. Figures compiled show that the rate for the foreign-born group is greater than that for the native group by 55 points in Manchester, by 37 in Waterbury, and by 67 in Johnston.

It is believed that the surprising difference

in favor of the foreign born in Brockton may be explained partially by the fact that the wages paid to skilled workers are high enough to permit them to live in comfortable circumstances. There is no problem of excessively poor housing conditions in Brockton, and there are no great numbers of foreigners of extremely low economic status with a correspondingly low standard of living.

**FRANKLIN DISTRICT MEDICAL SOCIETY.**—At the bi-monthly meeting of the Franklin District Medical Society, held on July 15, a dinner and reception was given to members of the Society who have returned from service in the United States Army and Navy. Among the speakers were Dr. Charles Upton, Dr. Charles Canedy, Dr. Alfred Johnson, Dr. F. A. Millett, Dr. John Mather, Dr. Roscoe Philbrick, Dr. Charles Molin, and Dr. Howard Kemp.

**GREATER BOSTON DENTAL SOCIETY.**—The 18th annual dinner of the Greater Boston Dental Society was held recently in Boston, with more than 40 members present. The meeting was arranged by the following committee of physicians: Dr. S. Krensky, chairman; Dr. I. Finklestein, Dr. S. Burke, Dr. H. Stearns, and Dr. A. J. Cushner.

**MASSACHUSETTS TUBERCULOSIS LEAGUE.**—It has been reported that the executive committee of the Massachusetts Tuberculosis League, a voluntary organization of which 80 anti-tuberculosis societies in all sections of the State are members, is in favor of prolonging the daylight-saving plan, in the belief that the additional amount of sunlight and fresh air which may be gained thereby is a means of prevention and cure of tuberculosis. A resolution to this effect has been passed and forwarded to the President and to the National Tuberculosis Association.

**RENOMINATION OF DR. J. ARMAND BEDARD.**—Dr. J. Armand Bedard of Lynn has been nominated a second time for the office of medical examiner of Essex County. The first nomination was made by the Governor on June 18. Although the Executive Council refused to confirm the appointment of Dr. Bedard, no reasons were given, and no question about his ability was raised.

**STATE INFIRMARY AT TEWKSBURY.**—The 65th annual report of the State Infirmary at Tewksbury shows that nearly 6,000 people have been cared for during the year. There have been 147 births and 662 deaths at the institution. Because of the absence of physicians in war service, the work has been conducted with the smallest possible number of physicians. There were 14 cases of diphtheria, 21 of typhoid fever, 42 of chicken-pox and 78 of measles; 321 cases of pulmonary tuberculosis were treated. The department for the insane admitted 92 new patients, and cared for a daily average of 720.49 patients. During the influenza epidemic, 2,188 patients were inoculated with "Leary vaccine," after which the spread of the disease is reported to have ceased within a short time. Seventy-five members from all departments have been in active service during the war. The nursing department and the training school for nurses have been maintained throughout the year with great difficulty, owing to the shortage of nurses; seventeen nurses were graduated.

**BOSTON UNIVERSITY SCHOOL OF MEDICINE.**—We regret that it was erroneously stated in a previous issue of the JOURNAL that at the annual meeting of the Alumni Association of the Boston University School of Medicine, held on June 2, plans were discussed for changing the system of teaching in that school. No changes are contemplated at this time.

#### NEW ENGLAND NOTES.

**EUROPEAN RELIEF FUNDS.**—On July 11, the totals of the principal European Relief funds of New England reached the following amounts:

French Orphanage Fund	\$504,612.41
Italian Fund	294,230.66
Polish Fund	130,977.53

#### Obituaries.

**NATHANIEL BOWDITCH POTTER, M.D.**

DR. NATHANIEL BOWDITCH POTTER died on July 5 at a hospital in San Francisco, California. Dr. Bowditch had been ill for several years, finally succumbing to tuberculosis. He was born in Keeseville, New York, on Decem-

ber 25, 1869, the son of George Sabine and Mary Gill (Powell) Potter. He was graduated from the College of the City of New York in 1888, and from Harvard in 1890, and from the Harvard Medical School with the degree of M.D., four years later. For many years Dr. Potter engaged in a wide practice as physician and surgeon in New York City. He had been professor of the clinical department at the College of Physicians and Surgeons of Columbia University, and had served as chief of the medical department at St. Mark's Hospital, as consulting physician to the French Hospital, to the New York Throat, Nose, and Lung Hospital, and to the Central State Hospital.

Dr. Potter had edited several medical editions of Sahli's "Diagnosis," and the first and second editions of Ortner's "Therapeutics." He was a member of the New York Academy of Medicine, the American Medical Association, the New York State and County Medical Association, and the Harvard Medical Association. He was an Officier de l'Instruction Publique and corresponding member of the Société Médicale des Hôpitaux de Paris. He was also a member of the University Club. In 1908, Dr. Potter married Miss Mary Sargent of Brookline.

#### HENRY TUCKER MANSFIELD, M.D.

DR. HENRY TUCKER MANSFIELD died on July 6, at the age of 81. He was born in Boston on February 2, 1838, the son of John Tucker Mansfield, a merchant who was United States consul at Parrambures, Brazil, from 1820 until 1836, and of Eloise Adeline (Story) Mansfield, who was the daughter of Dr. Elisha Story of Marblehead, a member of the historic "Boston Tea Party" of Revolutionary times. Dr. Mansfield received his education in the public schools in Salem and then attended the Harvard Medical School, from which he received his M.D. degree in 1869, and the same year he began active practice in Boston. On October 5, 1903, he was married in Needham to Edith (Mae) Bigelow.

In 1874 he removed to Needham, where he served as a member of the board of health and as town physician. In Civil War days Dr. Mansfield was acting assistant paymaster of the Navy. He retired from practice sev-

eral years ago. He was a member of the American Medical Association, the Massachusetts Medical Society, and the Norfolk District Medical Society.

#### DANIEL JOSEPH BROWN, M.D.

DR. DANIEL JOSEPH BROWN died of acute Bright's disease at his home in Springfield, July 8, 1919, aged 58 years.

The son of George and Helen Brown, he was born at Milford, Mass., January 28, 1861. He was educated at St. Lawrence Academy and at Harvard Medical School, where he took his M.D. in 1886. After three years of hospital and post-graduate work, he settled in Springfield, becoming, later, visiting surgeon to the Mercy and Springfield hospitals. In April, 1915, he was appointed a member of the Springfield police commission and held membership in the commission at the time of his death, having been at one time chairman. He was a member of the Springfield Academy of Medicine, the American Medical Association, the Massachusetts Medical Society, and the American College of Surgeons. In 1891, he married Mary E. Marden of Springfield. She survives him.

#### Miscellany.

##### RESUME OF COMMUNICABLE DISEASES FOR MAY, 1919.

###### GENERAL PREVALENCE.

For the month of May there were 7,476 cases of communicable diseases reported, as compared with 16,005 for the same month in 1918. The total case rate per 100,000 population for May, 1919, was 190.6; the case rate for May, 1918, was 415.8.

*Diphtheria*.—There were 559 cases of diphtheria reported during May, 1919, as compared with 663 for the same month in 1918, giving an incidence per 100,000 population of 14.3 and 17.2 respectively.

*Influenza* is still decreasing, 406 cases being reported this month as compared with 1,069 last month.

*Measles* again showed a drop as compared with the same month last year; there were 1,507 cases reported during May, 1919, while 6,335 cases were reported during the same month last year. This decrease from the reported cases of 1918 has appeared each month this year.

*Scarlet Fever* showed an increase over the same month in 1918, the cases reported being 805 and 487 respectively. The case rate per 100,000 population for May, 1919, was 20.5 as compared with 12.7 for May, 1918.

*Typhoid Fever* showed a distinct decrease in reported cases; 42 cases were reported during May, 1919, and 70 during May, 1918.

*Veneral Diseases*.—The number of cases of gonorrhea and syphilis reported during this month showed a slight increase over the corresponding month of 1918.

During May, 1919, 1174 cases were reported, 1121 were reported during May, 1918. The newly reported cases of gonorrhea were 812 and of syphilis 362. This is a moderate increase over the reported cases for the first two months this year.

Whooping Cough also showed a decrease in reported cases, there being 471 cases reported this month as compared with 1,001 for May, 1918.

#### OUTBREAKS.

Twenty cases of measles were reported by Groton on May 16. Investigation showed several undiagnosed cases at school, and absentees sick at home without medical attention. Better reporting of cases and inspection of schools by physicians brought results.

Of the eight cases of smallpox reported, five were traced to the outbreak on the schooner *Hesperus*, previously reported.

#### RARE DISEASES.

*Actinomycosis* was reported from Taunton, 1.

*Anterior Poliomyelitis* was reported from Ipswich, 1.

*Anthrax* was reported from Chelsea, 1; and Salem, 1; total, 2.

*Dog-bite requiring anti-rabies treatment* was reported from Brockton, 1; Groton, 2; and Lawrence, 2; total, 5.

*Epidemic Cerebrospinal Meningitis* was reported from Belmont, 1; Boston, 6; Brockton, 1; Cambridge, 1; Camp Devens, 1; Everett, 2; Fall River, 2; Gloucester, 1; Haverhill, 1; Lynn, 2; North Adams, 1; Northboro, 1; Quincy, 2; Weymouth, 1; Winthrop, 1; and Worcester, 1; total, 25.

*Leptospi* was reported from Boston, 2.

*Malaria* was reported from Boston, 1; Northbridge, 1; and Winthrop, 1; total, 3.

*Pellagra* was reported from Boston, 1; and Foxboro, 1; total, 2.

*Septic Sore Throat* was reported from Boston, 6; Brookline, 1; Framingham, 1; Haverhill, 1; Leominster, 1; Lynn, 1; Newbury, 4; Newburyport, 8; Newton, 3; Saugus, 1; Sharon, 1; Tewksbury, 1; Walpole, 3; Waltham, 3; and Watertown, 1; total, 36.

*Smallpox* was reported from Cambridge, 1; Edgartown, 1; Gloucester, 2; Ludlow, 1; and Springfield, 2; total, 7.

*Tetanus* was reported from Easthampton, 1; Malden, 1; and Pittsfield, 1; total, 3.

*Trachoma* was reported from Boston, 6.

## Correspondence.

### SUSPENSION OF REGISTRATION CERTIFICATES IN MEDICINE.

Boston, July 10, 1919.

Mr. Editor:—

Will you please call the attention of the readers of the JOURNAL to a very pernicious piece of legislation passed by the Legislature of the Commonwealth and approved by the then Governor of Massachusetts, during the year 1917?

This act is entitled "General Acts of 1917, Chap. 218, An Act Authorizing Boards of Registration to Suspend and Cancel Certificates of Registration." Under this act, the State Board of Registration is summoning before it, upon unjust complaints of irresponsible persons, reputable physicians, and compelling these physicians to defend themselves of the most absurd allegations on pain of losing their licenses to practice medicine in the State.

It is a matter of great importance to the medical profession as a whole, and I hope that all members who see this letter will at once write to their representatives in the General Court and urge the repeal or amendment of this act at the next session of the legislature.

Respectfully yours,

JOHN T. WILLIAMS.

### APPOINTMENTS.

The Board of Scientific Directors of The Rockefeller Institute for Medical Research announces the following promotions and appointments:

DR. HAROLD C. AMOSS, hitherto an Associate in Pathology and Bacteriology, has been made an Associate Member.

DR. OSWALD T. AVERY, hitherto an Associate in Medicine, has been made an Associate Member.

The following have been made Assistants:

MISS CLARA J. LYNCH (Pathology and Bacteriology).

DR. WARO NAKAHARA (Pathology and Bacteriology).

The following new appointments are announced:

DR. HOMER F. SWIFT, Associate Member in Medicine.

DR. FRANCIS G. BLAKE, Associate in Medicine.

DR. RAYMOND G. HUSSEY, Associate in Pathology and Bacteriology.

DR. J. HAROLD AUSTIN, Assistant in Medicine and Assistant Resident Physician.

DR. ALBERT H. EBELING, Assistant in Experimental Surgery.

DR. FERDINAND H. HAESSLER, Assistant in Pathology and Bacteriology.

DR. THORSTEN INGVALDSEN, Assistant in Chemistry.

DR. CHARLES W. BARRIER, Fellow in Pathology and Bacteriology.

DR. J. JAY KEEGAN, Fellow in Pathology and Bacteriology.

DR. PHILIP D. McMASTER, Fellow in Pathology and Bacteriology.

DR. ALPHONSE R. DOCHET, hitherto an Associate Member in Medicine, has accepted an appointment as Associate Professor of Medicine in the Medical Department of Johns Hopkins University.

DR. ARTHUR L. MEYER, hitherto an Associate in Physiology and Pharmacology, has accepted an appointment as Associate in Physiology in the School of Hygiene and Public Health, Johns Hopkins University.

DR. HOWARD A. STREETER, State Health Officer for the Berkshire District, was appointed, June 1, 1919, Chief of the Subdivision of Venereal Disease, State Department of Health.

### RECENT DEATHS.

MAJOR VICTOR CLARENCE VAUGHAN, JR., was accidentally drowned in France, on June 10, while on duty with the American Expeditionary Forces. Major Vaughan was born in Ann Arbor, Mich., in 1879. He was Associate Professor of Preventive Medicine and Assistant Professor of Medicine in the Detroit College of Medicine and Surgery, and the author of valuable contributions to pathology and bacteriology.

DR. AMOS J. GIVENS, President of the Givens Sanitarium in Stamford, Connecticut, died at that institution, on July 7, of heart disease. Dr. Givens was sixty years of age.

DR. ALFRED WILLIAM BARR, of Lawrence, died in the United States service, at Fort Slocum, N. Y., Oct. 8, 1918, aged 30. He was a Fellow of The Massachusetts Medical Society.

DR. ABRAHAM JACOBI died, on July 10, at his home on Lake George. Dr. Jacobi was educated in Germany, but received honorary degrees from the University of Michigan, Columbia, Yale, Harvard, and Jefferson Universities. From 1851 to 1853 he was held "in detention" in Berlin and Cologne because of his connection with the German revolutionary movement. After his release he came to the United States and began practicing in New York, specializing in the diseases of children.

WILLIS OLIVER BARNEY, M.M.S., died at Boston, June 25, 1919, aged 30, as the result of an automobile accident. He was a graduate of Tufts College Medical School in 1912. He made a specialty of otology, laryngology, and rhinology.



# The Boston Medical and Surgical Journal

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## Address.

### THE SHOEMAKER AND HIS LAST.\*

By E. H. BRADFORD, M.D., BOSTON.

If the adage is to be followed with safety, the shoemaker sticking to his last should make sure that the latter is suitably shaped.

Today this is difficult, as lasts are the product of the manufacturer, who furnishes them by the thousands, modelled each year according to the dictates of style and not anatomy. As is the case with the corset, the wearer of the shoe is to an extent the slave of the tyrant, fashion. If he or she desires emancipation, there is no escape from the stigma usually attached to eccentricity.

The manufacturer must follow the market, and the latter is the expression of the uninformed public, which seeks adornment provided the resultant distress is not too great.

The modern manufactured shoe can be worn in ordinary use without immediate discomfort, and the resulting disabilities are so gradual in their development that the shoemaker may escape blame as the cause of later ills usually attributed to inherited traits or rheumatic tendencies.

The foot of the young, like many other or-

gans, can bear much neglect and ill-treatment without complaint from the wearer, ignorant of the results of continued abuse, but if the question of unwise shoeing is looked at broadly and the effects upon human efficiency are considered, the subject becomes an important one.

It is difficult to over-estimate the amount of disability caused in our urban and suburban communities by modern shoes so great is the number of the crippled, and to anyone whose attention has been called to the subject for the last forty years it is apparent that deformities are now prevalent which were formerly uncommon and but little known. On the other hand, some deformities formerly common among men are less frequently seen than a decade ago and it is not unreasonable to expect that with increasing general knowledge of the subject, the ill effects of manufactured shoes will be materially lessened. There is great intelligence exercised and energy concentrated in the manufacture of shoes, and though some of the anatomical and physiological facts in regard to the human foot are not generally known by shoe manufacturers and dealers, they are of a nature which can be comprehended without difficulty if properly presented. Even stylish ladies' shoes can be made to be much less harmful than they are at present, and the walking shoe of men can be made nearly

\*Read at a meeting of the Surgical Section of the Suffolk District Medical Society.

as comfortable as a moccasin if proper thought and common sense are applied to the subject.

The attention paid by the Government in developing the army shoe has been of the greatest importance in this direction in educating the public and the manufacturer; but the result of this investigation of the subject should not end with the war and be limited to the comparatively small number of soldiers, but should be extended to the consideration of the footwear of the American people.

At first sight, the problem seems a simple one, and to the barbarian and the mass of toiling mankind, regardless of the appearance of footwear, little thought need be expended on the shape of foot covering: but communities which have passed the barefooted, the serf, and peasant stage of social development, look for something more than the mere matter of protecting the foot from wet and cold or injuries unavoidable in rough locomotion.

When the shoe becomes, instead of footcovering, one of the habiliment and an article of ornamental dress, the question becomes more complicated, not only as it is necessary to consider the varying fancies of individuals and periods but also because of the different shapes the foot, like the hand, may assume according to the uses to which it is put. Foot gear which fits the foot under certain conditions will be too tight under others.

The foot of the burden-carrying laborer needs to be broad, as the foot needs to spread to its capacity in its work of sustaining weight. The slippers of the dancer can be narrow, as in the spring of the "light fantastic toe" the front of the foot can be bound in one implement of energy instead of five independent digits of propulsion and support.

It is for the reason of the unusual adaptability of the foot to the different functions of locomotion that shoes varying in shape from that needed for the full use of the foot can be worn with little or no discomfort in standing or an easy gait.

The Chinese lady's distorted foot illustrates with what a small part of the foot locomotion, and even comparatively active locomotion, is possible. Shoes can be worn in an ordinary gait with little or no discomfort which cramp half the normal functions of the foot.

Trouble comes when the shoe limiting a certain function of the foot is used for a portion

of the step or for a manner of gait needing that especial function. When the front foot walker wears a heel walker's shoe, the cramped muscles are injured or strained as would the hand of a piano player be if wearing a snug-fitting glove or the writing hand if the fingers are restrained by even a lightly constricting elastic band. The evil done by the ill-adapted shoe may be unnoticed in its gradual progress, painless, and limited to the weakening and atrophy of muscles, particularly those which may be termed the thumb muscles of the foot, so important and useful among the barefooted. There may be, and not infrequently is, a definite displacement of some of the many bones of the foot with, in addition, shortened and disordered ligaments, creating a distortion which may become permanent and crippling.

Not only should every physician know of these disabilities and the measures needed to prevent them, but every manufacturer and shoe dealer also, as well as all thoughtful shoe buyers. To anyone examining the shoemakers' last, even those manufactured from well-considered designs like those used for the army shoes, the purpose of its shape is not clear. The shoe manufacturer may well claim that the practical shoemaker knows better than any doctor what shaped shoes the public wants, and that in view of much conflicting advice from physicians, the shape of the last must be left to the manufacturer, who also possesses the technical knowledge needed in stretching and stitching the leather attaching the sole to the upper and providing for as shapely a shoe as is needed.

On the other hand, the surgeon whose attention is directed to the various well-recognized shoe deformities, developed gradually and painlessly after the wearing of different types of shoes, is able to inform the community what types of shoes are undesirable or suitable only for certain kinds of locomotion. This knowledge is also eventually helpful to the shoe dealer, who though desiring only to sell his goods and not informed as to the ultimate results in weakening and distorting the foot, is anxious to obtain information which will enable him to give sensible advice to his customers.

Occasionally enterprising manufacturers, under the advice of a physician, will construct a shoe made from a plaster cast of the foot, forgetting that it is not the shape of the bare foot with its fatty and muscular tissue which needs

consideration, but the action of the skeletal form,—that is, the play of the bones in action. If this is not properly considered, the foot is hobbled: if it is, a shapely shoe may not be injurious.

It must always be remembered that the shape of the foot changes at the different stages of the step and that any hampering of these changes is ultimately injurious to the strength of the foot of those active on their feet, even though the wearer suffers no pain and may be unconscious of disability.

All shoe dealers know that pointed-toed shoes, crowding the toes, are not as good for the feet as broad-toed boots with adequate amount of room, and that the sole cut with a straight line on the inner edge is nearer the natural foot form than if the shape of the shoe forces the end of the great toe outward. But an almost equally important defect in the shape of the last is rarely considered.

If the articulated bones of the foot are placed in the normal position of the weight-bearing foot of a standing individual, it will be seen that the inner side of the foot from the ankle to the toes is much higher than the outer edge. The latter lies flat along the whole length of the fifth metatarsal.

Lasts, however, are flattened to a noticeable distance back of the ball of the foot and are frequently even hollowed down in this section. When the upper, shaped on such a last, is stitched firmly upon an unyielding sole, the resulting shoe exerts a downward pressure upon the front half of the first metatarsal, *i. e.*, on the inner side of the foot.

When the patient stands upon the foot in such a shaped shoe a faulty attitude is favored. An inward sag of the ankle developing a knock-ankle position results. This position throws the foot out of the best weight-bearing alignment and favors the development in time of plano-valgus or flat-foot. Shoes made on such a last have the advantage, as seen by the shoe dealers, of avoiding the development on wear of disfiguring folds and wrinkles of the front part of the upper. This, however, is of negligible importance in working shoes, which should give ample room for the proper weight-bearing position of the tarsus, which is not to the inner side of the mid-line of the foot.

The flattening of the front of the last has another disadvantage. The free action of the

toes and the toe clutch is impeded, as the heads and upper ends of the metatarsals are bound closely down to the sole, preventing normal flexion, keeping the proximal digits hyperextended, with flexion of the terminal digits as a result of the over-stretching of the flexis toe muscles.

The foot, pressed forward in the boot by the act of walking, is checked as it slides forward by the flattened upper and in time a humped-shaped dorsum of the foot may be developed, with a claw-like distortion of the toes.

This condition is favored by the unyielding cross seam frequently found in shapely boots and shoes stitched across the metatarsals.

Another common defect in the last is in shaping the sole with a long arch extending forward to the ball of the foot. This acts still further to throw the toes out of the action of flexion and also weakens by pressure the strong muscles of the sole of the foot.

A boot made small and flat in the waist from a faulty shaped last favors the development of what is termed the flattening of the cross front arch of the foot,—that is, the flexible arch of the heads of the metatarsals, found in most positions of the foot. As a result the greatest pressure of the backward-driving foot does not come upon the ball of the great toe and its strong digit but upon the smaller and less fat-protected third and fourth metatarsal heads, causing uncomfortable callous places in the middle of the front of the sole.

While the foregoing does not exhaust the list of defects of the manufactured last, it will be sufficient to indicate the need of more careful consideration in shaping it.

The ultimate evil results of badly shaped lasts upon the feet of the shoe-wearing public is not found, as is often supposed, only among the thoughtless devotees of style in foot wear. They are common also among the working class, who, knowing nothing in regard to the proper shape of footwear, buy anything furnished them which can be worn without immediate discomfort in their ordinary avocations, which do not usually tax to any great extent the muscles of the sole of the foot. These gradually become weakened, permanent distortions follow, and an incurably crippled old age results and an enfeeblement of working efficiency.

A working man or woman, limited in the ability to stand continuously without wearying foot ache, is deficient in working effectiveness.

The extent of this limitation among the working classes, if incalculable, is certainly much greater than is generally supposed.

Accurate statistics are wanting as to the amount of foot disability brought to light in the last draft, but there is no doubt that this is distressingly large. Much of this was unquestionably remediable by improvement in footwear and the exercises incident to drill.

The following instance is illustrative:—A healthy enlisted man, attached to a battalion of the regular troops stationed at one of the forts in Boston Harbor, found himself unable to drill without severe foot pain. The surgeons in charge could find no abnormality in shape or motion of the foot. He was unjustly considered a slacker by both officers and men, a charge which he indignantly resented, but as he was healthy and well-made, was difficult to disprove.

A special examination showed that, while the foot was well shaped and there was no paralysis, a noticeable lack of strength in the plantar muscles was present from previous shoe cramping. The young man after enlistment had been given clerical work for several weeks and then, without gradual training, had been put to hard heavy gun drill for several hours' continuous standing daily. He became completely incapacitated, was transferred to the hospital and only escaped discharge from the service by the special effort of the surgeon-in-charge, who personally arranged for graduated daily exercises developing the plantar muscles with limited and gradually increasing service. Three months' time was needed before active service was possible.

The number of cases of unnecessarily weak feet, grading from those without distortion to those of mild grades of knock-ankle, up to those suffering from crippling flat feet, was recognized as large by all physicians active in draft board examinations; and if it is remembered that those presented for examination represented only the able-bodied and younger men of our community, an idea can be formed of what the condition of the feet of the feeble, the older men and of the women may be. Certainly the rule of manufactured shoes and the control of last and shoe makers exacts a heavy toll of disability on the American public which is unnecessary and preventable.

The shoe industry in this country is not only

well organized, but is highly intelligent, and if its interested attention is turned to the subject, can readily provide for the proper modification of the shape of the last. This does not demand the manufacture of ugly or odd shaped shoes, but does demand a proper recognition of the fact that the foot is not a block of substance which must be held to a certain shape, but is a complex implement of locomotion whose functions should be safe-guarded, and these functions vary with the service demanded in different occupations.

A stylish boot can be worn as desired when style is needed, but a suitable working shoe should be available for the wear of everyone for hours of active service and the foot should be freed from compression in the leisure hours by the wear of moccasins or loose foot gear.

Abuse of the feet is appallingly great. The constant use each day, morning till bedtime, of constricting, hampering boots is much too common. The evil result of all-day use of tight gloves is evident, but no one considers that the feet have equal rights which all men should be bound to respect. In fact, a campaign for the emancipation of the human foot, the most abused part of the human body, not even excepting the digestive apparatus, is much needed in America, the land of manufactured shoes. The Oriental, even the Chinese, who foot-bind only selected females, might well look upon the urban American with derision for the folly of their mutilation of an important and useful part of their anatomy.

Shoe dealers entertain a fear of injury from shoes which are too short or which, not checking the forward slipping of the foot in the shoe, cause flexion of the toes. An elaborate mechanism and system was developed to prevent this in fitting the army shoe.

In attempting to obviate this evil it is, of course, undesirable to create others.

The check to the forward slipping of the foot cannot without injury be placed upon the middle of the front of the foot. It should be placed upon the firmer part of the tarsus and lower end of the tibia, as in the old army brogan or in the old fashioned boot. Furthermore, if free action of the toes is allowed, as is needed in the toe clutch and backward toe drive at the end of the step, crumpling of the toes does not develop as a deformity as is the case where the attempt is made to hold the toes down by flat-

tening the upper over the ball and waist of the foot.

Moccasin or sabot wearers walk without checks to the forward sliding of the foot; but the resulting foot is much less deformed in the toes, which have enjoyed ample room for muscular play and developed strength, than is observed in the usual manufactured shoes, which develop so commonly humped feet, flattened transverse arch, hammer and claw toes, not because the boots are too short but because they are unscientifically shaped.

The surgeon who treats foot deformities is undoubtedly unqualified to consider the trade demands of the shoe manufacturers, but he is justified in urging that the shoe last should have a proper resemblance to the shape of the normal foot and to its needs in action. It is manifestly the *reductio ad absurdum* of shoe fitting to attempt to obviate the resulting defects from shoes which are too flat, by fitting them too wide and several inches too long.

It is to be hoped that the study and thought which have been expended in considering the shaping and fitting of the shoes for Army use in the great war may lead to a more careful consideration of the sale and manufacture of shoes in civil life, to the furnishing of good looking shoes which are not injurious, and working shoes which are not crippling. If the American nation has poured out its treasures to free the world from the domination of autocracy, should it not be able to emancipate the human foot from the thralldom and bonds of ill-shaped shoes and the tyranny of the faulty last?

Style dominates costume, but the surgeon may well ask for workers a supply of shoes which, if not conforming to the natural shape of the foot, at least do not cripple it.

The manufacturer and shoe dealer should realize that, with a thoughtfully constructed last, shoes can be made which will not hamper too much the play of the toes and yet not be unsightly to an unmarketable degree. For such shoes it is of importance that the inner side of the last, well down to the line of the base of the toes, should be higher than the outer. The first metatarsal should not be pressed down to the plane of the fifth metatarsal, the tread of the sole should be broad, and the waist of the shoe should not be so tight as to limit the flexing of the toes within the shoe or the downward and

inward play of the great toe and its metatarsal when, in standing or sitting, weight comes on the front of the foot.

For any satisfactory improvement in the foot gear of our community, it is evident that the purchasing public should be fully informed as to the essentials of footwear.

For those to whom strength of foot is not necessary and the style of shoes is of importance, there can and will be no lack of well supplied shops, but there should be furnished for those who need unhampered feet in standing and walking in their vocation, shoes that do not weaken or cripple, to be worn in their working hours.

It is to be hoped that the war service may be able to call to the attention of the community the extent of the error of foot cramping. The energetic effort of the United States Government to develop a good service boot resulted in the development of a barrack shoe which was not unsightly or clumsy and was comfortable. An examination of the shape of the last and a comparison with the articulate bones of the foot shows that a better-shaped last could have furnished a better boot which would have obviated much of the difficulty met in fitting the army shoes. This was even more true in the service or trench boot.

Old-fashioned boots, made with the front and sides of the uppers cut out of one piece, became shaped in wear to the needs of the foot. The same was true of the loose, unlined army brogan laced around the ankle and not stitched down across the middle of the metatarsal bones, or with the lacings cut so that the leather stitching or wrinkled lining crowds and rubs the head of the first metatarsal.

When these defects are noticeable even in boots made, like the Army boot, with a careful consideration of the needs of the foot and yet without a full comprehension of the anatomy of the skeletal foot and its needs, it is unnecessary to consider what faults are to be found in shoes made only for style.

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INFLUENZA MORTALITY RATE IN SAMOA.—A recent report from Apia, Samoa, states that since the beginning of the influenza epidemic there have been 38,173 deaths, including 3265 men, 2704 women, and 1574 children.

## Original Articles.

### SOME OBSERVATIONS ON THE CHEST DURING THE INFLUENZA EPIDEMIC.\*

By PHILIP H. COOK, M.D., WORCESTER, MASS.,

*Röntgenologist, Worcester City and Memorial Hospitals.*

THE present pandemic of influenza has given the medical profession a wonderful opportunity to study affections of the chest from every angle and in infinite variety; if there be a bright side to the scourge which has recently been characterized by medical writers as the worst since the Black Death of the Middle Ages, it is this.

In this study the roentgenologist has endeavored to bear his part; the men at the Army camps, tackling the job with skill and enthusiasm with an abundance of material, and the carte blanche of the Government as to equipment and supplies, obtained a mass of information probably never before equalled. Frank acknowledgment is made by the present writer to Capt. Ernest L. Davis of Camp Devens, whose wonderful study of more than 1200 cases inspired him to undertake the present work at the Worcester City Hospital.

Since Nov. 1, every case of influenza which showed complications has been systematically radiographed, mostly at ten day intervals, and whenever possible the plate has been viewed in consultation with the representatives of the House service in charge of the patient.

A series of virulent cases was studied early in the epidemic by Dr. Selby of Washington, using a bedside apparatus to avoid disturbing the patient. Most of these began with some infiltration about the hilus of one lung; a day or two later, a faint shadow appeared in the lung tissue itself, resembling pneumonia in density, but unlike it in distribution; in another day or two the same appearance was presented in the other lung, while the physical signs of the cases remained only those of a severe bronchitis. Autopsy on the fatal cases showed the shadow to be due to actual hemorrhage into the lung substance.

The most frequent and serious complication is pneumonia. Our conception of this disease used to be of a lesion originating at the root of the lung and progressing outward till its arrival at the periphery made it possible of recognition by

physical signs. Within the past few years, however, the ray has shown that this is not usually the case. The typical patch of consolidation appears at the periphery of the lung and progresses inward, forming a triangle or truncated cone, before it can be diagnosed clinically. When the process reaches a bronchus sounds are transmitted, and the physical signs appear. The affected area may be sufficiently dense to suggest fluid, or merely translucent. Some cases begin as small patches of consolidation about the hili and primary bronchi; later the patches coalesce into the lobar type. A remarkable feature of the study at Devens was the 10% of their large series which, with all the clinical signs of pneumonia, and with the enlarged heart and high diaphragm characteristic of the roentgen picture, shows no consolidation during the entire course of the disease, indicating the strong part played by toxemia as compared with lung involvement, in producing the symptoms.

Other signs noted in pneumonia are streaks running from hili to apices (believed due to vascular congestion), high diaphragm on the affected side, and cardiac enlargement. This cardiac enlargement persists long after all clinical and radiographic signs in the lungs have disappeared, and the patient has returned to his regular occupation. We have not had the opportunity to follow such cases through, but Camp Devens and the Boston City Hospital have attempted it. In the B.C.H. cases the symptoms persisted so long that the medical and executive staffs refused to continue sending the patients for examination, on the ground that they were clinically fit for discharge; Camp Devens found it to last for from four to eight weeks after leaving the hospital, with the further observation that for the first three weeks after resumption of duty there was a gradual increase in size, suggesting dilatation under strain. The clinician may well give thought to this observation in the management of his convalescents.

The work at Camp Devens brought out another interesting clinical point in a class of cases which would never reach the non-military roentgenologist. The patients (mostly officers) had the symptoms of an acute bronchitis—malaise, cough, slight fever, not sufficient to interfere with their daily duties. The plates showed, in a large number of instances, many small foci of peribronchial density, mostly in the lower lobes, a true broncho-pneumonia.

\* Read before the Worcester District Medical Society, Feb. 13, 1919.

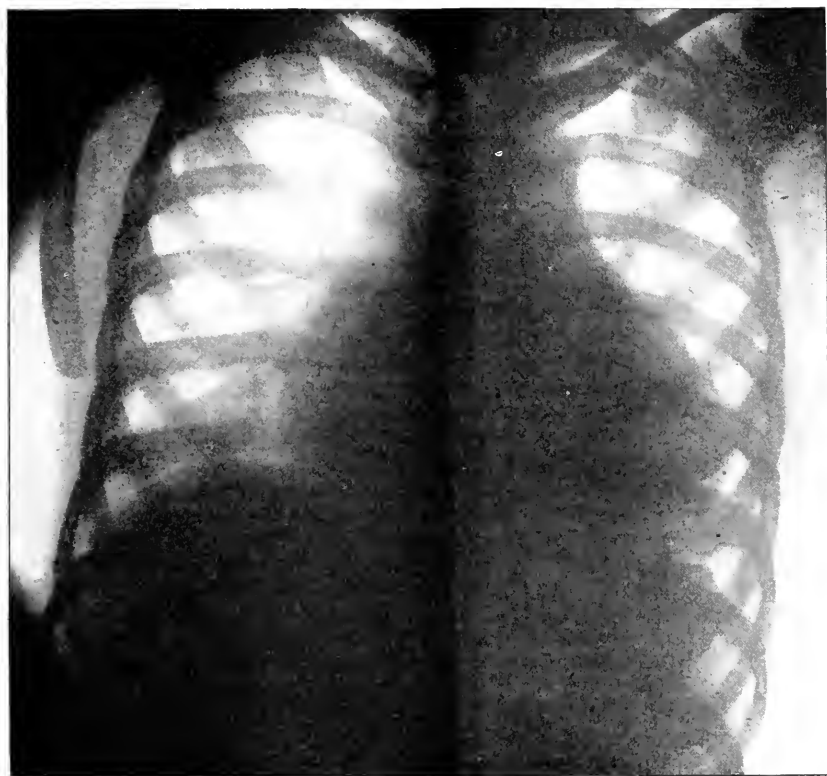


FIG. 1.—Pericardial effusion following influenza.

The resolution of many pneumonia cases is slow. Some develop into frank empyemata; others eventually clear up after passing through a stage which, from the roentgen standpoint, is hardly to be distinguished from tuberculosis. Kennon Dunham has proved that the characteristic markings of this disease are produced by the laying down of connective tissue in the parts of the lung affected; similarly, the profuse exudate of the influenza form of pneumonia, both in lung and pleura, undergoes fibrosis, producing a picture so like tuberculosis that the diagnosis of the latter disease is entirely unsafe unless it can be shown that the patient has not recently had an influenza pneumonia.

This young colored boy, Fig. 1, had double influenza pneumonia several weeks ago. He was sent into the hospital with diagnosis of fluid at left base. The roentgenogram shows no fluid

present, but an enormously enlarged cardiac and mediastinal shadow. The heart sounds are reported to be normal but faint. The opinion was expressed that pericardial effusion was present. Notice presence of C-H angle. Several diagnostic taps proved negative. The apparent signs of fluid in this case were probably caused by compressed lung.

Since the first picture the clinical picture has improved. The boy is better, but still runs some temperature. This picture (two weeks later) shows the left border of the heart to have receded considerably. In the original plate the left border shows the double shadow of heart and pericardium which is considered diagnostic. The right border is not as well defined, perhaps, owing to the thickening left in the lower lobe by the pneumonia process. The breadth of the mediastinal shadow is unchanged. Capt. Ernest

Hunt, now on the Pathological service at Camp Hancock, informs the writer that he has autopsied several fatal pericardial cases in which he found the mediastinal structures in a condition of brawny oedema, thickened and bulging beyond their limits. This may account for the appearance here shown. Capt. Hunt further states that in some of these cases diagnosis was made by a small trephine opening in the sternum, through which the pericardium was nicked.

We come now to the subject of fluid in the chest. In the present epidemic this serious complication appeared with great frequency and very early in the disease. In the army camps it was probably the most serious problem with which the surgical staff had to deal, for in the great majority of cases the effusion soon became purulent. In our series a surprising number were marked by absolutely contradictory physical signs. Time and again bronchial breathing and normal or increased voice sounds were reported by our best medical staff men over areas later shown to be occupied by effusion. It is, fortunately, in this very class of cases that the roentgen ray is of the greatest assistance in diagnosis and in the control of treatment.

Effusion appears on the roentgen plate as a shadow of uniform density, either in the axilla, with a curved border suggesting the famous S-curve of Ellis; or encapsulated, but still distinguishable from pneumonia by its uniform character and sharply defined border; or covering an entire side of the chest, especially if the fluid is free and the patient in the prone position; or, finally, when a diagnostic tap has admitted air and the picture is taken sitting, the definite fluid level is clearly shown. The single exception is in the presence of pneumonia. Here, even with the assistance of the sitting position, a small effusion is readily missed. The reason for this is believed to be that the lung, consolidated by the disease, is not readily displaced but presses the fluid out into a thin layer between itself and the chest wall, so that, with the increased density due to the pneumonic process, diagnosis is not easily made.

Among the points of assistance rendered by the roentgen examination may be mentioned the detection of abscesses or newly formed pockets of pus; of the re-accumulation of fluid; showing the reason for the inefficiency of drainage either by reason of the tube not reaching the pus cavity or extending above the level of the fluid therein;

and observing the expansion of the lung during convalescence.

This man, Fig. 2, was admitted to the hospital in October. Following pneumonia, the first plate showed effusion practically filling the chest. Several taps were made, all proving dry. A lateral plate was then taken which showed the effusion in the posterior half of the chest cavity. Following this a rib resection was done, which opened into a cavity between lobes, walled off by adhesions; still no pus was found. Two days later the pus burrowed through to the thoracotomy wound and drainage was established. The later plates show the pus free, with the characteristic horizon line of the pyo-pneumothorax, and the level subsiding each time, but still remaining at a considerable height. This case well illustrates the extraordinary difficulties of diagnosis and treatment sometimes encountered in this class of case. The presence of firm adhesions between lung and pleura probably accounts for much of it.

The later course of this case may be of interest. Improvement was slow, and early in March a stereoscopic roentgenogram showed a cavity at the right base posteriorly, estimated to be nearly as large as the head of a newborn child. Next day it was opened by stab wound under right scapula, and 4 ounces of very foul smelling, dark brown purulent material evacuated. A probe showed the cavity to be a little over 3 inches deep. Bronchial communication of large size was shown by the withdrawal of air bubbles with the fluid. Irrigation with Dakin's solution was started next day, and it was found possible to collapse the cavity entirely, the bronchial communication apparently closing as the last of the solution was withdrawn at the end of the operation. This fact was confirmed by roentgen examination four days later. The Dakin irrigation was done three times daily, and at night 1 ounce of 2% formalin-glycerine was injected and allowed to remain over night. Negative pressure was maintained between dressings by clamping end of drainage tube with hemostat.

The laboratory report on fluid from cavity shows streptococci in long chains (pure culture). Five days later no growth on culture was reported and irrigations were stopped. Later recrudescence of purulence forced resumption of technic for a while, but by April 10, culture was again negative and discharge very slight (three weeks after operation). The wound soon closed





FIG. 2.—Large Empyema which eluded diagnostic taps.

and the patient left the hospital. The treatment of this case has been reported in detail because it represented the method adjudged most satisfactory by the surgical staff. The negative pressure treatment was found of especial value, and it was nearly always checked up by the roentgen ray. Figs. 4 and 5 illustrate this, in the case of a child. In the first plate the outline of the partly collapsed lung is shown; in the second, taken after application of the dressing, the lung fills the chest.

The next plate, Fig. 3, is a most interesting one from a roentgen standpoint. It was stated some minutes ago that fluid frequently appeared as an area of uniform density with a definite boundary, in the region of the axilla after tapping. As we have seen, the effusion, unless encapsulated, follows gravitation about the chest cavity, and the resulting thickened pleura is patchy and irregular in outline. The first case in which the appearance here shown was found was that of an Army lieutenant who had been tapped nine times for recurrent empyema, and was still coughing up considerable quantities of muco-purulent material. Diagnosis of effusion

was made, and backed by the opinion of one of our best local clinicians. On taking his plates and report to an army camp this diagnosis was scouted by the Base Hospital surgeons there, who stated that it was characteristic of large numbers of their empyemata treated by the tapping, under negative pressure, not by thoracotomy, and that the line of demarcation represented the original extent of the pyogenic membrane, the whole shadow thus being due to thickened pleura. A few weeks later the patient here shown entered the hospital. He had been tapped, but no negative pressure used. He was now suffering from cough, pain, and elevation of temperature. After this plate was taken his wound was reopened, and a goodly amount of pus evacuated with relief. Opportunity to get another plate for comparison has not yet been presented.

The objections urged against the roentgen method are the danger to patients from manipulation, and the expense. As to the first, we have never had reported any ill effect. Very sick patients can be radiographed on the truck without the necessity of shifting to the examining table; as to expense, which for the large plates

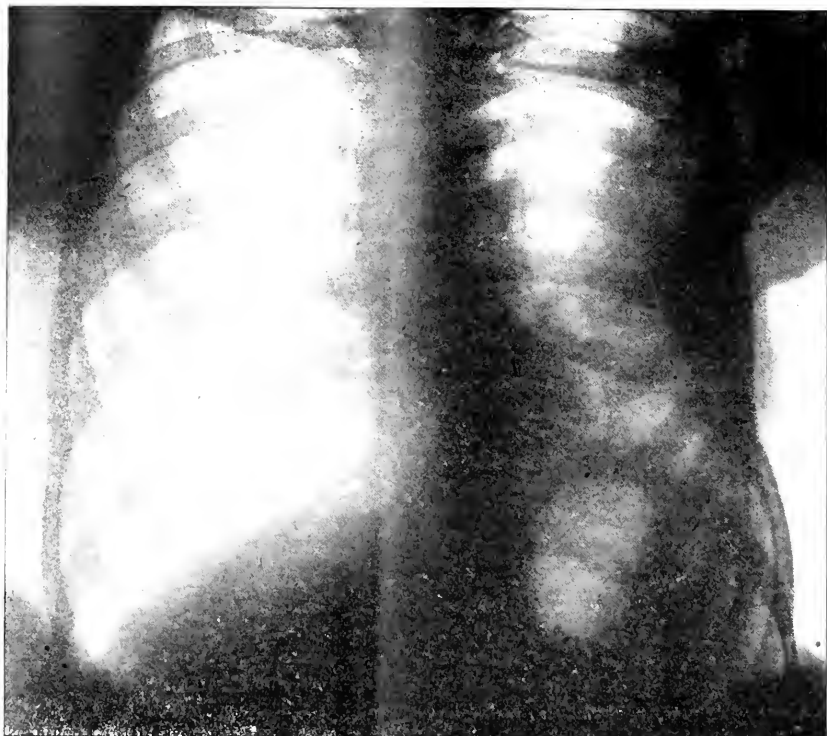


Fig. 1. Polymia and thickened pleura.

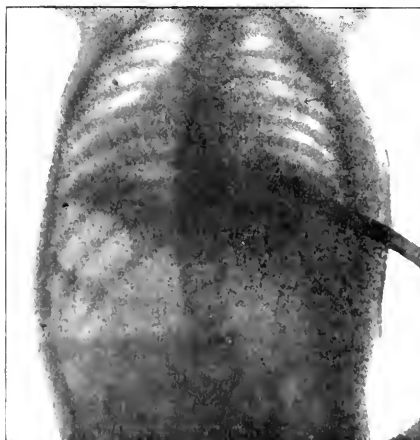


Fig. 2. Polymia and thickened pleura.

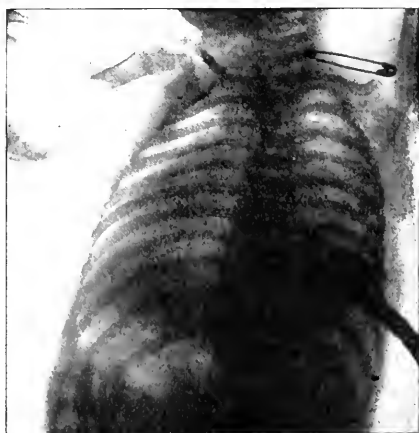


Fig. 3. Lung exposed after application of negative pressure dressing.

needed is, it must be admitted, considerable, we feel that in many cases the information given has shortened the patient's stay in the hospital sufficiently to compensate for the additional outlay. The stereoscopic method is, of course, the ideal one, but it entails double expense, presents grave difficulties where many of the patients speak no English, and, except in a few cases, sufficiently exact information is given by the single flat plate.

Much work remains to be done before the roentgenologist can regard his knowledge of the chest as complete. In spite of all the work done, there remain many shadows whose interpretation is doubtful at best. For the unraveling of these problems we bespeak the continued coöperation of pathologists and clinicians.

## A NEW SIGN OF NERVE REGENERATION.

BY ISADOR H. CORLIAT, M.D., BOSTON.

IN his work on "Nerve Wounds," Tinel directed attention to a new and important sign of nerve regeneration. This is termed "*le signe du fourmillement*," or the appearance of formication or tingling produced by pressure. This test, when taken in connection with the return of electrical conductivity and selective sensory regeneration to which I called attention in previous publications,<sup>1</sup> forms a triad of signs of regeneration which are very important from a practical standpoint, particularly in determining whether or not a nerve is spontaneously regenerating and thus postponing a projected suture, or in determining the actual success of a nerve suture. Thus the formication sign furnishes a very simple test for the detection of nerve regeneration.

Formication appears at a very early stage in nerve regeneration, usually at about the fourth or sixth week, while the return of electrical conductivity is a late development and usually only appears parallel with the return of voluntary movements. Formication in a nerve is a very important sign, for it indicates the presence of young axis-cylinders in the process of active regeneration. The anatomical and physiological<sup>2</sup> regeneration of a nerve always takes considerable time, since under the most favorable influences, the axis-cylinders do not grow

more than one or two millimeters a day. However, as I previously pointed out, electrical treatment actively affects the axis-cylinders in producing an increase in nervous energy.

Whether or not the formication sign can appear in defective regeneration leading to neuromata, can be determined only by future clinical study. Regenerating axis-cylinders are spontaneously capable of traversing a certain distance due to the neurotropism of the peripheral end, but if the axis-cylinders encounter an obstacle, become blocked and wander in the cicatricial tissue which impedes the advance, it seems reasonable to suppose that in these cases the formication will be limited to the area of the neuroma or scar tissue and not radiate down the peripheral distribution of the nerve. Here the formication will be felt only at the point of pressure and remain fixed there. There will be an absence of progressive formication in the cutaneous nerve distribution.

Since the test is a new one for all practical purposes, it seems best to quote Tinel's exact words in its description.<sup>3</sup>

"When compression or percussion is lightly applied to the injured nerve trunk, we often find in the cutaneous region of the nerve a creeping sensation usually compared by the patient to that caused by electricity. Formication in the nerve is a very important sign, for it indicates the presence of young axis-cylinders in the process of regeneration. This formication is quite distinct from the pain on pressure, which exists in nerve irritations. The pain indeed, which essentially indicates the irritation of the axis-cylinders and not their regeneration, is almost always local, perceived at the very spot where the nerve is compressed, or at least magnified at this spot; it always co-exists with the pain in the muscular bellies under pressure, very often the muscles are more painful than the nerve. Formication of regeneration, on the other hand, is but little or not at all perceived at the spot compressed, but almost entirely in the cutaneous region of the nerve; the neighboring muscles are not painful. As a rule it appears only about the fourth or sixth week after the wound. It enables us to ascertain the existence of this regeneration and to follow its progress.

"If it remains fixed and limited to one spot for several consecutive weeks or months, this is because the axis-cylinders in their regenera-

tion have encountered an insurmountable obstacle and are forced to group together on the spot in a more or less bulky neuroma.

"The fixity of formication on a level with the lesion and the complete absence of formication below the lesion would almost warrant our affirming the complete interruption of the nerve and the impossibility of spontaneous regeneration.

"If, on the other hand, the regenerated axis-cylinders can overcome the obstacle and make their way into the peripheral segment of the nerve, we see a progressive migration of the formication so provoked. Pressure on the nerve below the wound produces this sensation, and from week to week it may be met with at a spot farther removed from the nerve lesion. The presence of formication provoked by pressure below the nerve lesion warrants our affirming that there is more or less complete regeneration.

"The zone of formication so brought out, changes its place on the nerve at the same time that the axis-cylinders are advancing; it extends progressively towards the periphery at the same time that it disappears at the level of the lesion.

"The 'formication sign' is thus of supreme importance, since it enables us to see whether the nerve is interrupted or in the course of regeneration, whether a nerve suture has succeeded or failed, or whether regeneration is rapid and satisfactory or reduced to a few insignificant fibres.

"Formication lasts a tolerably long time; appearing about the fourth week, it persists during the entire regeneration, *i.e.*, for eight, ten, twelve months or more, gradually drawing nearer the extremity of the limb. It ceases only when the regenerated axis-cylinders have almost regained their adult stage.

"Formication, however, may be absent, both on a level with the lesion and below it: this absence is an unfavorable prognostic point; it shows that the nerve regeneration is taking place imperfectly, mainly because of general disturbance of nutrition.

"The more it extends and shows itself towards the periphery of the nerve, the less marked it becomes, finally disappearing at the level of the portions of the nerve which are nearest the lesion. Consequently there is in the course of the nerve a wide zone of formication which can be brought on, spreads centrifugally,

corresponds to the zone of growth of the young axis-cylinders, and at last completely disappears when the nerve fibres have regained their fully formed state.

"Let us follow, for instance, the progress of formication on a sciatic nerve sutured in the middle of the thigh: about the fourth week the formication appears at the level of the suture; at about the eighth week it is ascertained to be a few centimeters below; after three months it reaches the popliteal nerves at the upper third of the leg, but at the same time it disappears at the level of the lesion; at the fifth month the nerve formicates on pressure from the popliteal space to the level of the malleoli; finally, in the sixth month, it has reached the feet, but has disappeared as far as the upper third of the leg.

"Formication is the best and almost only sign of regeneration of the nerve; for not only does it enable us to follow the progress of regeneration, but through its intensity, rapidity of migration, and the region in which it appears, it even supplies exact information regarding the quality, extent, or limitation of regeneration.

"If the axis-cylinders stray and lose themselves in the tissues next to the lesion, formication reveals them; thus, in an interruption of the musculo-spiral, André-Thomas was able to demonstrate the presence of stray axis-cylinders in the muscles of the forearm.

"Any nerve that formicates below the lesion is a nerve in course of regeneration, either partly or wholly; absence of formication over the entire extent of a degenerated nerve trunk is an almost certain sign of absence of regeneration."

The following cases of nerve injury are briefly reported in order to show how the test is carried out and its value when taken in connection with other clinical signs of nerve regeneration. If unusual stress is laid upon the formication sign, it is because we wish to emphasize its importance in these particular instances.

CASE 1. Bayonet wound of the right tibial and peroneal nerves, followed by immediate paralysis and loss of sensation in the motor and sensory distribution of these nerves. The nerves were sutured the day following the injury.

Seven months after the injury and suture, an examination revealed foot-drop, inability to flex or extend the foot or move the peroneal

muscles, and moderate wasting of the thigh and calf muscles. The foot was cold and cyanotic, the skin was glossy and the nails had grown very slowly. There was a disturbance of both protopathic and epicritic sensation over the lateral cutaneous, saphenous, superficial peroneal and plantar nerves. In the atrophied muscles there was a complete reaction of degeneration with polar inversion.

Pressure over the scar of wound and operation in the right popliteal space produced formication at the point of pressure radiating down the internal portion of the calf to the big toe, in the region of the superficial peroneal nerve. The sense of tingling in the big toe was quite distinct.

After six weeks treatment with galvanism and massage, the motor paralysis remained the same, but the trophic disturbance improved, the foot became less cyanotic and the nails began to grow. The formication sign became more marked, it could be elicited on slight pressure and radiated down the inner border of the calf and anterior surface of the foot, including the big toe. It now involved the distribution of the saphenous and superficial peroneal nerves and a portion of the plantar nerves over the entire area where sensation was disturbed, whereas at the first examination it was limited to peroneal distribution. The formication was now entirely in the cutaneous distribution of the nerves below the point of the lesion, while it had disappeared in the scar tissue at the point of pressure. This latter was important, since it seemed to indicate the advance of regenerating axis-cylinders from the point of lesion.

The formication was not fixed on the scar since fixity of formication would indicate that an obstacle had been encountered in the scar tissue or that a neuroma had formed.

CASE 2. Pressure ulnar lesion, coming on about a week after a major operation and followed by progressive numbness, weakness, coldness and tingling of the area innervated by the ulnar nerve. An examination about four weeks after the onset of the difficulty showed a weakness and moderate atrophy of the ulnar group of muscles, typical sensory disturbances and a partial reaction of degeneration. Pressure over the ulnar nerve at the elbow produced distinct tingling of the little finger, showing that the axis-cylinders were not destroyed but were function-

ing properly, in spite of the sensory disturbances, weakness and atrophy and partial reaction of degeneration. On the basis of this a good prognosis for complete recovery was given.

CASE 3. Following a fracture dislocation of the neck of the left humerus and an injury to the brachial plexus, the small internal cutaneous nerve was found torn. It was sutured about a month after the accident. About seven months later, although the condition had greatly improved, the entire arm was found weak with slight muscular wasting, sensory disturbances over the cutaneous distribution of the small internal cutaneous, musculocutaneous and median nerves. There was a partial reaction of degeneration. No tingling on pressure over the site of scar of operation over pectoralis. Pressure in axilla produced tingling over ulnar distribution of the hand; pressure on lower end of biceps muscle produced formication in the fingers along distribution of ulnar and median nerves. Since the ulnar and median nerves were involved in the brachial plexus injury, it seems that they were in process of regeneration.

CASE 4. Traumatic ulnar lesion caused by lacerated wound of the left lower arm from glass. Numbness appeared in the ulnar region immediately after the accident with loss of power and coldness in the little and ring fingers. An x-ray showed a piece of glass close to the ulnar bone. An examination seven months after the accident demonstrated a weakness and atrophy of all the muscles innervated by the ulnar nerve with typical sensory disturbances and a reaction of degeneration. There was no formication on pressure over the scar, and no tingling around the scar. Pressure on the upper portion of the arm, above the scar, produced formication in the little finger, a demonstration that conduction through the regenerating axis-cylinders was unimpaired from the normal portion of the nerve through the lesion to the peripheral distribution of the nerve. Pressure below the scar produced the same sensation.

CASE 5. Ulnar lesion of the left arm produced by a rifle bullet. The bullet entered midway into the ulnar aspect of the left forearm, stopped at the olecranon process and shattered

the upper portion of the ulna and the head of the radius. The ulnar nerve was severed at the time of the accident and was sutured about eleven months later.

An examination two years after the accident showed typical epieritic and protopathic sensory disturbances over the ulnar distribution and weakness and slight atrophy of the ulnar group of muscles. The scar was a little tender on pressure and the patient complained of a little spontaneous tingling in the region with occasional shooting pains along the ulnar nerve. Pressure over the scar at any point produced formication along the ulnar aspect of the hand and radiating to the little finger. Pressure over the ulnar nerve at the elbow also produced tingling along the ulnar aspect of the hand and the little finger. This case demonstrated the same fact as did Case 4, namely, a persistence of regenerating axis-cylinders in the vicinity of the lesion. In this case, however, the time that had elapsed between the suture and the testing for formication was greater than any of the series, nearly two years. It proves, as Tinel has pointed out, that formication may last a long time, although its persistence in this instance was greater than in any of Tinel's material. It showed that the axis-cylinders were still in an active process of regeneration and had not yet regained their adult and mature stage.

CASE 6. Ulnar lesion produced by a bullet wound in the ulnar side of the right forearm. An x-ray showed a foreign body 3 inches below the skin mark on the anterior surface of the right forearm near the ulnar. An examination nearly three weeks later showed weakness of the muscles innervated by the ulnar nerve with typical ulnar sensory disturbances. There was no muscular atrophy. Electrical tests showed a complete reaction of degeneration. Pressure above the scar of the wound produced formication of the ulnar side of the hand and of the little finger. Pressure below the scar produced the same sensation, but less intense. Evidently we are dealing here with a very rapid regeneration of axis-cylinders, since marked formication could be produced by pressure above the nerve lesion.

To summarize briefly, we have in the formication sign a valuable test for the detection of nerve regeneration. The test is very easily applied, but should be carefully done in each case, as the tingling produced by neuroma formation

may lead to error. In neuroma formation or in the early stages of regeneration without neuroma formation, the formication is limited to the level of the lesion. In the neuroma formation also, where the regenerating axis-cylinders are blocked and may consequently lose themselves in the surrounding tissues, the formication remains fixed at the level of the lesion. In actual regeneration of the nerve the formication progresses over the zone of the growth of the axis-cylinders and can finally be detected along the partial or entire cutaneous distribution of the nerve. For a time it may involve the entire cutaneous distribution, but as regeneration becomes complete, it finally can be detected only in the extreme periphery.

The exact cause of this formication it is difficult to state, but since it can be produced by a far lighter pressure than formication in an uninjured nerve, it probably is due to an increased sensitiveness of the young axis-cylinders. It is best, however, not to rely upon the formication sign alone. The test should be carefully correlated with the other investigations of the nerve lesion, such as protopathic and epieritic sensibility, regenerating pain points, and electrical reactions.

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- <sup>2</sup>For recent work in the physiology of peripheral nerves, see Keith Lucas' "The Conduction of the Nervous Impulse," 1917.
- <sup>3</sup>J. Tinel, *Nerve Wounds*, 1917, pp. 34, 35; 75, 76.



## DIAGNOSIS AND TREATMENT OF SYPHILIS.\*

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THE responsibility which rests on the physician of making an early diagnosis of syphilis is very great and cannot be too frequently brought to his attention. The majority of people consult the general practitioner first, and he is the one who must be made to realize that the life and future usefulness of the patient suffering with syphilis depends upon the early diagnosis and

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proper intensive treatment in the first six months or year of the disease.

At the present time every physician has at his command the laboratory where serological examinations can be made to aid in the diagnosis, and it is gross negligence for one to rely too much on his ability as a diagnostician, or to place too much dependence on the history and observations of the patient. Aside from the aid to diagnosis, the Wassermann report is a valuable part of the record of the case. Taking blood for the Wassermann is a simple operation which can be done by any careful worker, and, if done more often, would prove most valuable in clearing up so many of our obscure, chronic and persistently troublesome cases.

While speaking of the Wassermann test, let me here mention the fact which we all know, that one positive Wassermann does not necessarily mean lies any more than one negative means that a person has not lies, or that a treated case is cured. The laboratory test is a most helpful aid in making a diagnosis and in checking up a case under treatment, but it is not infallible. It is always a safe plan to have more than one Wassermann if there is any question of the clinical signs. One must remember in certain cases of syphilis, such as ocular syphilis, certain visceral lesions, central nervous system infection, and latent hereditary cases, there may be definite clinical signs and a negative Wassermann.

The dark field illumination furnishes a valuable means of corroboration in all suspicious genital and extragenital lesions, and the diagnosis of chaneroid should not be positively made without this examination to exclude the possibility of a coincident infection with the *treponema pallidum*, for it is well known that the soft sore frequently harbors the parasite of syphilis.

The primary lesion of syphilis is described as a red spot or papule which develops in the course of a few days into a hard, round infiltration varying in size from a small pea to a bean. It is a well-defined infiltration which can readily be felt between the fingers. It is dull red in color, painless and hard. If dry and not exposed to friction it remains as a firm papule. When exposed to friction, the surface becomes eroded, and may remain smooth without granulations, and covered with a seropurulent exudate, or the center may become ulcerated and covered with

a necrotic membrane. This is the so-called Hunterian chancre.

The characteristic features of the initial lesion are the sharply circumscribed dense induration, absence of subjective symptoms and the slow, indolent course. In cases of mixed infection these characteristics are often absent, or masked by the more acute inflammatory process.

The secondary stage begins when the spirochete gains entrance into the general circulation and the disease becomes constitutional. General enlargement of the lymphatic glands is the first objective evidence of the secondary stage. The inguinal, cervical, epitrochlear and axillary glands are most commonly affected, and are usually small, painless, non-tender and indolent. They remain enlarged during the eruptive stage, and gradually disappear. Occasionally some of the glands, especially the inguinal, remain enlarged for years.

The secondary cutaneous eruption may be of all types from macules to nodules. The color is brownish red, or is often described as ham color. The eruption occurs in characteristic groups, in circles or segments of circles, is generalized and bilateral. It is often more abundant on the forehead, around the nose and mouth, front of the trunk, and on the palms and soles. The multiformity of lesions is quite characteristic of syphilis, as is the absence of subjective symptoms of itching, burning, and pain. When one takes into consideration the combination of these characteristics, it forms a symptom complex, which makes the differential diagnosis from other cutaneous diseases fairly simple in the majority of cases.

I will not take time to go into the various types of syphilitic eruption, but would suggest that you frequently review the subject, for now, more than ever before, we are being urged to take a more active part in trying to control and check the spread of this dread disease. The public is being educated by moving pictures, lectures and literature, and a well organized campaign has been launched by the government health authorities, and we, as physicians, must be able to recognize the disease and be active in this great crusade for the health of our people. The physician is entrusted not only with the health of the individual who consults him (for each case is capable of such far-reaching effects that he cannot afford to treat it lightly, or as an individual case), but must keep in mind the

fact that one cannot calculate how far the infection may spread from one person with open lesion, and also that the health of the coming generation is dependent upon him.

The tertiary stage is characterized by the development of gummatous lesions in the tissues. These cause irreparable damage, and result in scar formation. When the lesions are cutaneous the diagnosis is, as a rule, simple, but the same process may go on in the viscera and give rise to grave subjective symptoms.

The Wassermann reaction becomes positive only after the infection has become generalized, and the time given by different writers varies. The earliest date recorded is by Craig, who found a positive Wassermann five days after the appearance of the primary lesion. Boas reports the usual time to be the sixth or seventh week; and Fordyce reports the majority after the fourth week. When the secondary stage is well developed, and the patient presents cutaneous manifestations, Fordyce states, the reaction is positive in 100% of cases.

The Wassermann is most valuable in checking up cases where the diagnosis was made in the primary stage by the dark field and aborted by early intensive treatment.

One of the greatest advances made in our knowledge of syphilis is that involvement of the central nervous system takes place in the secondary stage. It is, therefore, most important that the physician should study his patient closely, and be keen to observe beginning eye changes or other signs of central nervous system involvement.

We all know that when a patient has an infection with the *treponema pallidum*, that person is doomed to a long and protracted course of treatment, but let me state here that there is no prescribed course of treatment that can be followed in all cases with the assurance that the patient must be getting well. We must be alert for signs of involvement of the neuroaxis, and vary our treatment as the condition presents itself.

Unless there is some special indication for it, lumbar puncture should not be made until the patient has had at least one course of salvarsan. Until about two years ago lumbar puncture was not made until a case was about to be discharged as cured, unless there were clinical symptoms of neuro-syphilis, but now an early puncture is made to determine the status of the

infection, and to give the patient the benefit of early treatment to prevent the pathological changes of optic atrophy, tabes, and paresis.

It has been stated that the infection of the cerebrospinal axis is not a matter of chance, but follows infection by a special strain of spirochete. To discover the infection in the spinal fluid, before pathological changes have developed, is one of the greatest advances of preventive medicine, because, by proper treatment, tabes and paresis can be prevented.

The technique of lumbar puncture is as follows:

The patient lies on his side, with hips just over the edge of the bed. The knees are flexed on the abdomen, and the shoulders bent forward to approximate as nearly as possible the knees. The upper shoulder is then drawn slightly forward. The puncture should be made in the median line, in the second and third, or third and fourth lumbar interspace. The point of entrance of the needle is marked on the skin by the fingernail. The skin is then washed with soap and water, tincture of iodine and alcohol. An 18 gauge Quincke needle is used. This is dry sterilized in a glass container. When puncture is made for diagnosis, two sterile tubes are used. In one 2 c.c. of fluid is collected for the cell count and globulin test, and in the other 6 or 7 c.c. for the Wassermann and colloidal gold tests. The cell count and globulin tests are done immediately.

When the examination or puncture is made at the patient's home, the fluid should be prepared for examination at the bedside, and the cell count made as soon as the physician reaches the office or laboratory. The globulin test is as follows: About 1 c.c. of Pandy solution (saturated solution of carbolic acid) is placed in a small test tube, and one drop of spinal fluid added. Shake tube to see if there is any color change. Then add three more drops, and read. If positive, the solution will have a cloudy, opalescent appearance.

The cell, or leucocyte, count is as follows: Use white blood counter. Draw up 15% acetic acid to the I mark on the pipette, which is then filled to the II mark with spinal fluid. The fluid in the capillary portion of the tube is then blown out, and a drop of fluid from the chamber run onto the counting stage. The cover slip is then placed on the slide with firm pressure. The cells on the whole ruled surface of



the Thoma-Zeiss chamber must be counted. This number multiplied by 10 and divided by 8 gives the number of cells in one cubic millimetre of undiluted fluid. A cell count of five in a cubic millimetre is normal.

The Wassermann reaction is the important factor in determining the treatment in all cases. In early cases, with a weakly positive reaction and low cell count, only intravenous treatment, together with mercury injections, are employed; but if this does not bring about negative findings, then the combined treatment must be instituted.

If, on first examination, the Wassermann reaction is found to be strongly positive with 0.4 or 0.2 e.c. of fluid, the combination of intravenous and intraspinal treatment should be started at once.

The colloidal gold test is valuable in making a differential diagnosis in the types of neurosyphilis, and a paretic curve will be shown in the preparetic stage before a clinical diagnosis can be made. This test gives most valuable aid in the treatment of the case. A paretic curve may be found in brain abscess and multiple sclerosis, but in these cases we do not get a positive Wassermann.

The complete examination of the spinal fluid consists of a Wassermann test, globulin test, cell count and colloidal gold test.

In the past, tabes and paresis have been diagnosed clinically by the neurologist. Then the damage is done, pathological changes have taken place, and the best one can hope for is an arrest of symptoms; but restoration to normal conditions is impossible. We must prevent these changes taking place.

The treatment generally used is the Swift-Ellis-Ogilvie.

For intraspinal treatments, the patient should be given appointments for a series of treatments at intervals of two weeks. Eight treatments constitute a course; and an interval of two months should be allowed between each course. A day or two before the intraspinal treatment is given the patient receives an intravenous injection of salvarsan, 0.4 to 0.6 gram. One-half hour later 50 cc. of blood is removed in a sterile tube, and kept in the refrigerator over night. The following day it is centrifuged and the serum pipetted off into another sterile tube, and centrifuged again to make sure there are no remaining red cells. To

this serum is added 1/20 to 1/2 mg. of salvarsan, according to the needs of the case. This is inactivity at 55 to 57 degrees C. for thirty minutes, and is then ready for administration.

Treatment is usually begun with 0.1 mg., and increased gradually to 0.5 mg. Patients with paresis tolerate larger doses than those suffering with tabes or other forms of cerebro-spinal syphilis. By doing lumbar puncture one can detect early changes; so why defer doing a simple, harmless operation when so much can be revealed, and so much is at stake?

Much is said against the intraspinal treatment, because so often it has been tried on well advanced neurological cases, and the results have been so disappointing. We must not deny any possible help to those who, in their suffering, are reaching out for a straw; but the great field of service for this method of treatment is along the lines of preventive medicine, and the physician who can carefully check up his cases by accurate laboratory examinations cannot help becoming converted and most enthusiastic about this form of treatment.

The management of a case of syphilis should not be in the hands of the general practitioner, for, while he may be able to clear up all physical signs of the disease, he is not capable of assuming the great responsibility of a cure. The advances made in the treatment of syphilis have been so great that even specialists today must be very alert in order to be up to the minute.

Treatment of cases where there is no involvement of the central nervous system is influenced by the stage of the disease and the individual susceptibility of the patient.

In the uncomplicated cases of lues the following general rules for treatment are suggested:

If a case is seen in the primary stage (before the spirochete has gained the general circulation) a full dose of salvarsan should be given at once. These patients should be given a full course of treatment, which consists of six or eight doses of salvarsan and twelve injections of mercury, at intervals of one week. A few days should elapse between the salvarsan and mercury injections. Even though the Wassermann may still be negative, it is well to use the proverbial ounce of prevention and give a second course, or give mercury for several months.

If the case is seen in the secondary stage, a mercury injection should always precede the salvarsan treatment, to prevent a Herxheimer reac-

tion. A Herxheimer reaction is an intensification of symptoms which sometimes follows the first injection of salvarsan. It may be due to the sudden freeing of spirochetal proteins, or irritation of the living organisms themselves. In about two days the regular course of treatment may be instituted. Treatment should always be given in regular courses of six to eight injections of salvarsan, together with twelve injections of mercury at weekly intervals. Rest one month, and take a Wassermann. Three courses are given in a year. If the Wassermann becomes negative after the first course, do not stop there, but give a second course. Ordinarily an early case can be cured in two courses.

In tertiary cases the treatment varies greatly with the needs of the case, but it is here that the mixed treatment is of greatest value, and potassium iodide will often bring about most remarkable changes in both subjective and objective symptoms.

The dose of salvarsan is regulated according to the age, sex and weight of the patient. The general rule for an adult is 0.1 gm. for every thirty pounds. The usual dose is 0.3 gm. to 0.5 gm. for men, and 0.2 to 0.4 gm. for women.

For the mercury injections, either the soluble or insoluble preparations may be employed. If the soluble form of mercury is to be used, injections should be given every day, or every other day, and if the insoluble salt is used, the injections are given at weekly intervals.

A treated case of lues may be pronounced cured when the Wassermann has been persistently negative for one year, without treatment, and after a provocative salvarsan.

### The Massachusetts State Committee, Council of National Defense, Medical Section.

#### LIST OF MASSACHUSETTS PHYSICIANS IN THE MEDICAL CORPS OF THE UNITED STATES ARMY, NAVY, THE RED CROSS, OR BRITISH SERVICE DURING THE WORLD WAR.

COMPILED BY THE MASSACHUSETTS STATE  
COMMITTEE, COUNCIL OF NATIONAL DE-  
FENSE, MEDICAL SECTION, JULY, 1919.

NAMES in Roman face type are those who served  
in the Army, unless otherwise indicated. Names in

italic type are those recommended for commissions,  
but not called to service.

#### A

Aaronson, Jacob	Chelsea
Abbe, Frederick R.	Dorchester
Abbot, Edward S.	Belmont
Adams, Donald S.	Boston
Adams, Edward A.	Newton Lower Falls
Adams, Frank D.	Boston
Adams, William B.	Springfield
Adams, Winthrop, Navy	Worcester
Adams, Zabdiel B.	Boston
Agnew, John R.	Chicopee
Ahearn, Cornelius A., Jr.	Salem
Ahern, John Francis	Dorchester
Aimone, Victor A.	Winchester
Akerly, Arthur W., K.	Boston
Albee, George M.	Worcester
Alexander, T. Branch	Scituate
Alexander, Harry L.	Boston
Alexander, Kirke L.	Orange
Alford, Leland Barton, Navy	Dorchester Ctr.
Allard, Carleton E.	Dorchester
Allen, Arthur W.	Boston
Allen, Fred H.	Holyoke
Allen, Granville S.	Lawrence
Allen, William H.	Mansfield
Alling, Marshall L.	Lowell
Allison, Carl E.	Somerville
Amiral, Hiram H.	Boston
Anderson, John H.	Brookline
Andrews, Robert E.	Cambridge
Andrews, Sumner C.	Gloucester
Angell, Worcester Randolph, Navy	Brookline
Annis, Sumner B.	Natick
Anthony, George C.	Wellesley
Applebaum, Jacob, Navy	Boston
Arnold, Horace D.	Boston
Arnold, Seth F., Navy	Boston
Aschmann, Theodore H.	Boston
Ash, James E.	Boston
Ash, Richard M.	West Quincy
Ashmore, Buell L.	Palmer
Atchison, C. M., Navy	New Bedford
Atkinson, Frederick Charles	McThuen
Aub, Joseph C.	Boston
Andet, Charles H.	Salem
Austin, Arthur E.	Boston
Ayer, James B.	Boston

#### B

Babeock, Harold L.	Boston
Bacon, John L.	Southboro
Bacon, Joseph A. P.	Lawrence
Badger, George S. C.	Boston
Baff, Max	Worcester
Bagnall, Elmer S.	Groveland
Bailey, Charles H.	Gardner
Bailey, Frederick J., Navy	Dorchester
Bailey, Karl R.	Boston
Bailey, Walter C., Red Cross	Boston
Baker, Horace M.	Boston
Balch, Franklin G.	Boston
Ball, Arthur N.	Northampton
Banquer, Jacob E.	Boston

Bard, Henry H.	Pittsfield	Boland, Daniel J.	Worcester
Bardwell, Frederick A.	Boston	Bolduc, Alfred G.	Attleboro
Barnes, Frederick R.	Fall River	Bobotov, Nathan A.	Boston
Barnes, Harry A.	Boston	Bonelli, Raymond P.	Boston
Barnes, Louis D.	Lanesboro	Bonneville, Alfred J.	Hatfield
Barney, Willis O., Navy	Boston	Boothby, Walter M.	Boston
Barnum, Francis G.	Boston	Bostick, Warren J.	W. Springfield
Barrett, Michael Francis	Prockton	Bottomley, John T.	Boston
Barrow, Allen R., Navy	Allston	Boutwell, Horace K.	Brookline
Barrow, William H.	Boston	Bowen, James F.	Amherst
Bartlett, William B.	Concord	Bowers, George F. H.	Worcester
Bartol, Edward F. W.	Milton	Boorman, Herbert Eli	Winter Hill
Bartol, John W.	Boston	Boyd, James Van W.	Springfield
Basch, William E. R.	Winthrop	Boyer, Joseph N., Jr.	Springfield
Batchelder, Hollis G.	Uedham	Brackett, Elliott G.	Boston
Bates, Charles A.	Ashburnham	Bracy, James Madison	Roxbury
Baum, Evald G.	Natick	Brady, Cecil Norbert	W. Newton
Baxter, Clarence P.	Topsfield	Brady, William Francis	Holyoke
Baxter, William E.	Topsfield	Bragg, Leslie R.	Webster
Bail, Howard W., Died in service	Worcester	Brant, Austin, Navy	Boston
Beals, L. H.	Northampton	Brassil, T. F.	Cambridge
Bean, Harold C., Navy	Boston	Brearton, Edward J.	Dorchester
Bearse, Carl	Boston	Breed, Nathaniel P.	Lynn
Beaudet, Elphege A.	Lowell	Bremer, John L., Red Cross	Boston
Beaupre, Dolor I.	Holyoke	Brennan, Joseph T. L., Navy	Lowell
Beeckley, Chester C.	Lancaster	Bresnahan, John F.	Boston
Bedard, Joseph Armand, Red Cross	Lynn	Bressler, Charles W.	Boston
Beebe, Theodore C.	Boston	Brickley, William J., Navy	Boston
Begg, Alexander S.	Jamaica Plain	Bridges, E. Stanley, British Service	Worcester
Behrman, Roland A.	Roslindale	Bridgwood, David, Navy	Worcester
Belding, David L.	Watertown	Briggs, Lloyd V.	Boston
Bell, Richard D.	Somerville	Briggs, Maurice T., Navy	Boston
Benner, Richard S.	Springfield	Brigham, Francis G.	Boston
Benoit, S. J.	Gardner	Brindamour, Joseph E.	Holyoke
Bergeron, George G.	Springfield	Brine, Elmer L., Navy	Boston
Berr, Alfred William, Died in service	Lawrence	Brown, Abe A.	Waltham
Berry, Frank B.	Cambridge	Brown, Arthur L.	Winchester
Berry, Gordon	Worcester	Brown, Chester P.	Chelsea
Berry, Walter D.	Braintree	Brown, Percy	Boston
Bigelow, Edward B.	Worcester	Brown, Ralph N.	Malden
Bigelow, George H.	Boston	Brown, Roy F.	Fall River
Bigelow, James B.	Holyoke	Browne, William E.	Boston
Bill, José P.	Boston	Brumelle, Arthur L.	New Bedford
Binney, George H.	Boston	Browninghaus, Charles W.	Worcester
Binney, Horace	Boston	Bruckshaw, Andrew N., Navy	Fairhaven
Biondi, George A.	Framingham	Bryant, John	Boston
Birdsall, Clarence H.	Boston	Bryant, Mason D.	Lowell
Birnie, John M.	Springfield	Bryer, James A.	N. Attleboro
Bisbee, Ernest S.	Boston	Ruck, William E.	Chelmsford
Bishop, Franklin L.	East Boston	Buckley, George A.	Brockton
Bishop, W. A.	N. Abington	Buckley, James T.	Marlboro
Blair, Orlando R., Navy	Springfield	Buckley, William S.	Brighton
Blaisdell, John H.	Boston	Buckman, Thomas E.	Boston
Blake, Gerald	Boston	Budington, Harold F.	Springfield
Blanchard, Paul D.	Lowell	Budroski, Alphonse F.	Brighton
Blanchard, William B.	Framingham	Full, Edward C.	Boston
Blanchard, William H.	Allston	Bunker, Henry A., Jr.	Boston
Blanchette, William H.	Fall River	Bunker, Sidney M.	Worcester
Blodgett, Stephen H.	Lincoln	Bunnell, George L.	Foxboro
Blood, George W.	Fall River	Burke, Francis R.	Quincy
Blue, John Jacob, Navy	Nantucket	Burke, George H.	Springfield
Bosdman, William P.	Boston	Burke, John H.	Jamaica Plain
Bock, Arlie V.	Boston	Burke, John R.	Boston
Bogan, Fred L.	Boston	Burkhead, James H.	Middleboro
		Burnett, Francis L., Navy	Manchester

Barnett, Louis R. ....	Cambridge	Chase, Daniel E. ....	Cambridge
Barnette, John E. ....	Brockton	Chase, Frank H. ....	Chelsea
Barham, J. Forrest ....	Lawrence	Chase, Gilman L. ....	Clinton
Burns, John E. ....	Cambridge	Chase, Heman B. ....	Hyannis
Burns, William B. ....	Dorchester	Chase, Henry M. ....	Boston
Burpee, Benjamin P. ....	Boston	Chase, James G. ....	Hanson
Burpee, Carroll C. ....	Malden	Cheever, Austin W., Navy ....	Mattapan
Burrell, Harry C. ....	Medford	Cheever, David, British Service ....	Boston
Burt, Clarence E. ....	New Bedford	Cheney, Harry C. ....	Palmer
Burt, Edward W. ....	Westport	Cheney, Marshall C. ....	Boston
Bushnell, Edward H. ....	Quincy	Chereskin, Johnston L. ....	Springfield
Butler, Charles S. ....	Boston	Chisholm, Lawrence C., Navy ....	Salem
Butler, David M. ....	Brockton	Chisholm, Miles D. ....	Westfield
Butler, George E., Navy ....	Fall River	Choate, Alton J. ....	Gloucester
Butler, Patrick F. ....	Allston	Choquette, Hormidas ....	New Bedford
Butler, Samuel ....	W. Medway	Christian, Henry A. ....	Boston
Byrne, William R. ....	Framingham	Christie, James D. ....	Littleton
Byrnes, Harry F. ....	Springfield	Chronquest, Alfred P. ....	Danvers
		Claffy, John M. ....	Springfield
Cabot, Hugh, British Service ....	Boston	Claney, Leo J., Navy ....	Holliston
Cabot, Richard C. ....	Boston	Clark, Albert U. F. ....	Westboro
Cady, Frederic B. M. ....	Cambridge	Clark, Cecil W. ....	Newtonville
Cahill, Harry P. ....	Boston	Clark, Dewitt S. ....	Salem
Cahill, John W. ....	Worcester	Clark, Ernest M. ....	Ashburnham
Cahill, Thomas J. ....	Cambridge	Clark, Frank R. ....	Newtonville
Caines, Richard J. R. ....	Boston	Clark, Frederick T. ....	Westfield
Caldicott, Francis S. ....	Billerica	Clark, Harry A. ....	North Andover
Callahan, Henry A. ....	Jamaica Plain	Clark, Millard C. ....	Lawrence
Callahan, John F. ....	Brockton	Clark, W. Irving, Jr. ....	Worcester
Callanan, Francis J. ....	Boston	Clarke, Joshua W. ....	Attleboro
Campbell, Franklin E., Navy ....	W. Medford	Clarke, Philip H. ....	Holyoke
Candoy, Charles F. ....	Greenfield	Clarke, Willis E. ....	Malden
Cannon, Walter B. ....	Cambridge	Clear, Robert E., Navy ....	Holyoke
Caples, Thomas F. ....	Haverhill	Clevery, Harry F. ....	Schmata
Capelle, C. S. ....	Roxbury	Clifford, Randall, Navy ....	New Bedford
Carden, Charles J. ....	Haverhill	Cline, Samuel, Navy ....	Roxbury
Carleton, Francis B. ....	Boston	Clondman, Harry R. ....	Brockton
Carley, Arthur W. ....	Ayer	Clute, Howard M. ....	Boston
Carlton, Frank C. ....	Salem	Clymer, George ....	Boston
Carney, Harold E. ....	Boston	Coates, Edward A., Jr. ....	Chelsea
Caro, Heiman, Died in service ....	Palmer	Cobb, Chester T. ....	Northampton
Carpenter, Robert J. ....	North Adams	Cobb, Gardner N., Navy ....	Boston
Carr, Arthur W. ....	Bridgewater	Coburn, Harry R. ....	Tewksbury
Carroll, John P. ....	Woburn	Cochrane, Robert C. ....	Boston
Carroll, Michael J., Navy, Died in service. ....	Lenox	Codman, Ernest A. ....	Boston
Carroll, Thomas F. ....	Brockline	Coffin, Frank H. ....	Haverhill
Cassidy, Franklin C. ....	Medford	Coffin, Rockwell A., Navy ....	Boston
Caswell, Bertram H. ....	Somerville	Coffin, Whitman K. ....	Provincetown
Caulfield, Thomas E. ....	Woburn	Cogswell, George P. ....	Cambridge
Cavanaugh, Mortimer T. ....	Gt. Barrington	Cogswell, William ....	Haverhill
Cavanaugh, Thomas E. ....	Holyoke	Cohen, Nathan M. ....	Dorchester
Ceconi, John A. ....	Dorchester	Cohen, Samuel A. ....	Roxbury
Chadwell, Orville R. ....	Boston	Colby, Fletcher H. ....	Boston
Chaffin, George L. ....	Boston	Coleman, Daniel B. ....	Wellesley
Chagnon, Deodatus T. ....	Lowell	Colgate, Charles H. ....	Rockland
Chaffin, Samuel E. ....	Cambridge	Collins, John F. ....	Marlboro
Chambers, Ralph M. ....	Westboro	Collins, Joseph D. ....	Northampton
Chamberlain, Harold A., Navy ....	Boston	Collins, William J. ....	Northampton
Chandler, Clarence L. ....	Fitchburg	Collins, William M. ....	Lowell
Chandler, Harold B. ....	West Newton	Colton, Hubert P. ....	Westfield
Chandler, Thomas E. ....	Brookline	Colwell, Howard S. ....	Worcester
Chapin, William A. ....	Springfield	Colwill, Albert W. ....	Worcester
Chaput, Lucien R. ....	Haverhill	Condric, John J. ....	Brockton
Chase, Charles O., Navy ....	Watertown	Council, Thomas M. ....	Walpole

Connelly, John E. ....	Brookline	Cushing, Harvey ..... Brookline	
Conner, Homer L. ....	Haverhill	Cutler, Elliot C. .... Boston	
Connery, William L. ....	Springfield	Cutter, Irving T. .... Winchester	
Connolly, William E. ....	Dorchester		
Connor, George A. ....	Cambridge		
Connor, George J. ....	Haverhill		
Connor, Harold J. ....	Boston		
Connor, William H., Navy .....	Pittsfield		
Cook, James H. ....	Quincy		
Cook, Paul C., Navy .....	Pittsfield		
Cook, Robert J. ....	Boston		
Cook, William W. ....	Brookline		
Cooke, George A. ....	Montague		
Cooney, Michael E. ....	Northampton		
Cooran, George B., Navy .....	W. Springfield		
Corr, Francis X. ....	Dorchester		
Cort, Parker M. ....	Springfield		
Cosgrove, Joseph J. ....	Westfield		
Cotter, Edward J., Navy .....	Boston		
Cotting, William F. ....	Boston		
Cottle, George F., Navy .....	Edgartown		
Cotton, Frederic J. ....	Boston		
Councilman, William T. ....	Boston		
Coupal, James F. ....	Boston		
Courie, Wadie F. ....	Boston		
<i>Courtemanche, Joseph A.</i> .....	Lynn		
Courtney, Thomas J., Navy, Died in service. ....	Waltham		
Cowett, Max P. ....	Chicopee Falls		
Cowles, Dwight, Navy .....	Beverly		
<i>Coxles, William L.</i> ....	Boston		
Cox, Oscar F., Jr. ....	Boston		
Cox, Stanley C. ....	Holyoke		
Cox, Thomas .....	Fall River		
Craibtree, Ernest G., British Service .....	Boston		
Craigin, George A. ....	Boston		
Crandall, Walter M. ....	Lawrence		
Crandon, Le Roi G., Navy .....	Boston		
<i>Cranz, Alvin H.</i> ....	Brookline		
Crawford, Frank W. ....	Holbrook		
Cremens, John F., Navy .....	Cambridge		
Crimmin, Leo P. ....	South Boston		
Crockett, Eugene A., Red Cross .....	Boston		
Crofton, George H. ....	Worcester		
Crofts, Nicholas M. ....	North Adams		
Crosbie, Arthur H. ....	Boston		
Cross, L. H. ....	Winchendon		
Crothers, Bronson .....	Cambridge		
Cullen, Charles A., Navy .....	Hyde Park		
Cunna, Manuel F. ....	Boston		
Cunningham, Edward A. ....	Belmont		
Cunningham, Richard A. ....	Boston		
<i>Cunniffham, Thomas D.</i> ....	Boston		
Curley, Clarence P., Navy .....	Provincetown		
Curran, Arthur M. ....	North Adams		
Curran, George L. ....	North Adams		
Curran, Simon F. ....	Dorchester		
Currier, Cyrus R., Navy .....	Sandwich		
Curtin, John F. ....	Lawrence		
Curtin, John J. ....	Waltham		
<i>Curtis, Charles L.</i> ....	Salem		
Curtis, Harlan F. ....	E. Longmeadow		
Curtis, W. G. ....	Wollaston		
Cushing, Arthur A. ....	Brookline		
		D	
		Dacey, Cornelius I. .... Brockton	
		Dahlen, Carl A. .... Boston	
		Dailley, Edward J. .... Somerville	
		<i>Daland, Ernest</i> .... Wakefield	
		Dalrymple, Sidney C. .... W. Medford	
		Dalrymple, Alfred T. .... South Boston	
		Dalton, George F. .... Springfield	
		Dalton, Stephen J. .... Marlboro	
		Dana, Harold W. .... Boston	
		Danforth, Murray S. .... Boston	
		Darling, Arthur E. .... Lynn	
		Darling, Charles B. .... Boston	
		Darling, Eugene A. .... Cambridge	
		Dascombe, Otho L. .... Waltham	
		<i>Davidson, Harvey D.</i> .... Springfield	
		Davis, Charles H. .... So. Hamilton	
		Davis, Ernest L. .... Springfield	
		Davis, Frank A. .... Boston	
		Davis, Henry L. .... Lynn	
		Davis, Lincoln .....	Boston
		Dean, Archie L., Jr. ....	Boston
		Dearborn, George V. ....	Cambridge
		Dearborn, Henry F. ....	Lawrence
		Dedrick, Albert C. ....	Fall River
		Deems, Oren M. ....	Springfield
		<i>Deering, Charles F.</i> ....	Danvers
		<i>Deering, George E.</i> ....	Worcester
		Delaney, Thomas B. ....	Lowell
		Dempsey, J. Edward .....	Newton
		Dennen, Ralph W. ....	Waltham
		Deunett, Daniel C. ....	Winchester
		Dennett, Paul C. ....	Allston
		Denning, William E. ....	Worcester
		Denny, George P. ....	Boston
		Derby, George S. ....	Boston
		Devan, Thomas A. ....	Boston
		Devenny, Joseph H. ....	Dorchester
		DeWolf, Charles W. ....	Tewksbury
		Dexter, Fred F. ....	Longmeadow
		Diehl, Harold E. ....	Quincy
		Dillenback, Emil F. ....	Springfield
		Dillon, William J. ....	Springfield
		Dimento, Vincent J. ....	Boston
		Dobson, Clarence H. ....	Conway
		Dobson, William M. ....	Dorchester
		Dodd, Isaac, S. F. ....	Pittsfield
		Dodge, Arthur M. ....	Boston
		Dodge, Ralph O. ....	Hyde Park
		Dolan, William F. ....	Quincy
		Dole, Kenneth L. ....	Jamaica Plain
		Dolloff, Eugene M. ....	Lynn
		Donovan, Jeremiah J. ....	Roslindale
		Donovan, Thomas R. ....	Fitchburg
		Donovan, Timothy S. ....	Lawrence
		Donovan, Walter .....	Springfield
		Donnet, Charles S. ....	Lowell
		Dow, David C., Navy .....	Cambridge
		Dow, Frank E. ....	Northampton

Dow, George E. ....	Reading	Faunce, C. B., Jr. ....	Boston
Dowling, John J. ....	Boston	Favour, Richmond, Jr. ....	Natick
Downing, Dana F. ....	Westboro	Faxon, Nathaniel W. ....	Stoughton
Downing, John G., Navy ....	Boston	Fay, William J. ....	Worcester
Doyle, John H. ....	Fall River	Feeley, Walter, Navy ....	Cambridge
Drake, Wallace H. ....	N. Weymouth	Felch, George A. ....	Boston
Draper, Frank E. ....	Boston	Fellows, Albert W. ....	Boston
Dresel, Rudolph L. ....	Boston	Fennelly, Daniel J. ....	Fall River
Drouin, Wilfred ....	Holyoke	Fennessey, John F. ....	Dorchester
Drury, Dana W. ....	Boston	Fenton, Alfred A. ....	Norwood
Dubois, Eoline C., Red Cross ....	Springfield	Ferauld, Guy G. ....	Concord Jct.
Dudley, Augustus W., Navy ....	Cambridge	Fiege, Herbert R. ....	Waverley
Dudley, Charles ....	Kingston	Field, Charles K., Red Cross ....	Brookline
Dudley, Oscar A. ....	Cohitate	Field, Henry M. ....	Norwood
Duff, John, Jr., Navy ....	Charlestown	Fielden, John S. C., Jr. ....	Fall River
Duffy, Edward A. ....	Boston	Finkelstein, Harry ....	Boston
Dunham, Harry B. ....	Brockton	Finnegan, Francis A. ....	Lowell
Dunn, Joseph H. ....	Rockland	Finnegan, Philip J. ....	Salem
Dunphy, P. J., Navy ....	Boston	Finnerty, Charles W. ....	W. Somerville
Dunthoff, L. C. ....	Lowell	Fiske, Eben W. ....	Boston
Dwinell, George F. ....	Boston	Fitts, Henry B., Navy ....	Provincetown
Dwyer, John E., Jr. ....	Cambridge	Fitts, John B. ....	Boston
Dwyer, William J. ....	Cambridge	Fitz, Reginald ....	Boston
Dyer, Ernest A. ....	Salem	Fitzgibbon, Edward J. ....	Dorchester

## E

Eastman, Alexander C. ....	Springfield	Flagg, Elisha ....	Boston
Eastman, George W., Navy ....	Lynn	Flagg, Harry H. ....	Charlestown
Eastman, Luther G. ....	Newton	Flanders, Walter H., Navy ....	Melrose
Eaton, Harold B. ....	Boston	Fleming, Peter J. ....	Mattapan
Eaton, William E., Navy ....	Boston	Fletcher, Robert S. ....	Oxford
Edwards, Martin R. ....	Boston	Folkes, Howard E., Navy ....	Brockton
Eldridge, David G., Navy ....	Dorchester	Fogg, Neil A. ....	Boston
Eliot, Henry W. ....	Belchertown	Foley, Joseph D. ....	Springfield
Ellam, Herbert W. ....	Gardner	Foran, Francis L. ....	Worcester
Ellison, Daniel J. ....	Lowell	Forbes, Alexander, Navy ....	Milton
Ellsworth, Samuel W. ....	Boston	Forbes, Henry S. ....	Boston
Ely, Theodore W. ....	Boston	Ford, John F. ....	Roslindale
Emerson, Benjamin K., Jr. ....	Worcester	Forhan, Neil K. ....	Billerica
Emerson, Francis P. ....	Brookline	Fornell, Carl H., Navy ....	Quincy
Emerson, Paul W. ....	Boston	Foss, George H. ....	Springfield
Emery, George E. ....	Worcester	Foster, Ellis E., Navy ....	New Bedford
Emery, Robert L. ....	Rockport	Foster, John H. ....	Boston
Emery, Wm. Edward, Died in service, Beverly		Fox, William Y. ....	Taunton
Emmons, Arthur B., 2nd ....	Boston	Frain, Irving W. ....	Waltham
Emmons, Henry M. ....	Jamaica Plain	Fraser, Archibald M. ....	Boston
English, Umberto M. ....	Foxborough	Fraser, Somers ....	Boston
English, Martin J. ....	Boston	Fraser, William L. ....	Lynn
Erlenbach, James H. ....	Boston	Fregean, Aime N. ....	Fitchburg
Ernst, Harold C. ....	Jamaica Plain	French, Edward ....	Brighton
Eustis, Richard S. ....	Boston	French, Leland M., Navy ....	Worcester
Evans, Robert J., Jr. ....	Springfield	Fried, Anton R. ....	Newtonville
Eveloth, Samuel C. ....	Marblehead	Frothingham, Channing ....	Boston
Everett, Frederick L. ....	Springfield	Fullerton, Walter W. ....	Brockton
Ewing, Edward H. ....	Stoughton		

## F

Fahyan, Marshall ....	Boston	Gabler, George L. ....	Holyoke
Fairbanks, Arthur W. ....	Boston	Gaefani, Arthur L., Navy ....	Dorchester
Falk, Jacob B. ....	Boston	Gage, Homer ....	Worcester
Fallon, Joseph F. ....	Brookline	Gallagher, John H. C. ....	Chicopee
Falvey, Humphrey J. ....	Worcester	Gallagher, Nicholas A. ....	Malden
Farr, Irvin H. ....	Holyoke	Galvin, Augustus, H. ....	Springfield
Faulkner, William E. ....	Boston	Canby, A. L. ....	Methuen
		Garbelnick, David A. ....	Haverhill
		Gardner, Archibald R. ....	Lowell

Gardner, Howard E., Navy	Springfield	Greene, Edward C.	Northampton
Gardner, Leroy U.	Cambridge	Greene, Jeremiah A.	Cambridge
Garfield, Walter T.	Belmont	Greene, Ransom A.	Palmer
Gates, Ernest A.	Springfield	Greene, William H., Navy	Boston
Gay, Fritz W.	Malden	Greenough, Robert B., Navy	Boston
Gay, Leslie N.	Boston	Greenwood, Allen	Boston
Gay, William H.	Sharon	Griennard, George A.	Fitchburg
Gelineau, Joseph H.	Easthampton	Guiler, Robert W.	Newton
Genereux, Edmond A.	Worcester	Gunter, Fred C.	Somerville
Gennert, Jacob	New Bedford	Guthrie, Andrew D., Navy	Medford
George, Ariel W.	Boston	Gwynne, Samuel C.	Worcester
George, Arthur P.	Haverhill		
George, Frank W.	Worcester	Hadfield, Jonathan P.	Fall River
Gerrard, Henry C.	Springfield	Haigh, Gilbert W., Navy	Worcester
Gettings, James H.	Boston	Hale, Frank S.	Boston
Ghoreyeb, Albert A. W.	Boston	Hale, William L.	N. Attleboro
Gibson, Frank L.	Holyoke	Haley, Paul J. D.	Medford
Gilbert, Maurice A.	Chelsea	Hall, Francis C.	Boston
Gilechrist, John M.	Springfield	Hall, John B.	Roxbury
Gilechrist, Virgil M., Red Cross	Boston	Haller, David A.	Boston
Gillilan, Donald R.	Worcester	Hamburg, Miles M.	Waltham
Gillespie, Norman W.	Boston	Hamilton, Albert J. A., Navy	Boston
Gillon, Charles J. C., Navy	Taunton	Hamilton, Burton E.	West Roxbury
Gilman, Charles S.	Boston	Hamlin, William E.	Waltham
Glass, James	Framingham	Hammond, John W., Jr., Navy	Cambridge
Gleason, Benjamin W.	Athol	Hammond, William J.	Dorchester
Goddard, Fred C.	Brighton	Hand, Edward P.	Holyoke
Godvin, Bernard A.	Boston	Handy, Harry T., Red Cross	Scituate Center
Goethals, Thomas R.	Boston	Hanley, Francis J.	Whitman
Goffin, John L. C.	Boston	Hanson, Morgan P., Navy	Cambridge
Goldberg, M.	Lynn	Hannon, Daniel F.	Pittsfield
Golden, Ross	Boston	Hansem, Ridgely F.	Newton Center
Goldman, Ahbrum M.	Boston	Hapgood, Lyman S.	Cambridge
Goldthwait, Joel E.	Boston	Hardwick, Everett V.	Dorchester
Goodall, Edwin B.	Boston	Hardwick, Sydney C.	Quincy
Goodall, Harry W.	Boston	Hardy, Wilbert C.	Boston
Goodell, William	Springfield	Harkins, Cornelius P.	Westfield
Gooding, John H.	Boston	Harkins, William J.	Quincy
Goodpasture, Ernest W., Navy	Boston	Harner, Torr W.	Boston
Goodwin, James J.	Clinton	Harriman, Cora E., Red Cross	Framingham Cr.
Gookin, Edward R.	Dorchester	Harriman, David E.	Springfield
Gordon, Louis	Boston	Harriman, Frank E.	Worcester
Gosline, Harold I.	Boston	Harrington, Clifton W.	Everett
Gould, Clarke S.	Norwood	Harrington, Thomas F.	Boston
Gould, James A.	Westboro	Harris, Carl T.	Boston
Goulding, Timothy F.	Boston	Harris, Charles E.	Hyannis
Grabfield, Gustave P.	Boston	Harris, Lorne W.	Cliftondale
Grady, J. E.	Leominster	Harris, Walter C., Navy	Millbury
Graham, James M.	Revere	Hart, Joseph S.	Lincoln
Graham, J. Perry	Springfield	Hartmann, Gustave	Lynn
Graham, Otis L.	Boston	Hartnett, Edward D.	E. Boston
Grainger, Edward J.	Winthrop	Harvey, John W.	Boston
Grandison, Louis J.	Charlestown	Harvey, Samuel C.	Boston
Granger, Frank B.	Boston	Haskins, Abraham	Boston
Grant, W. Herbert	Boston	Hassett, Leonard W.	Lynn
Grasso, Antonio	Springfield	Hassman, David M.	Boston
Graves, Benjamin A.	Dorchester	Hatch, Ralph A.	Brookline
Gray, George H.	Lynn	Hathaway, John G.	New Bedford
Gray, Horace	Boston	Hatt, Rafe N.	Boston
Greaney, William F.	Holyoke	Havens, Leon C.	Boston
Green, Hyman	Dorchester	Haywood, Ralph W.	Salem
Green, Milo C.	Boston	Healy, Thomas R., Navy	Newburyport
Greene, D. Crosby	Newton Center	Hearn, Walter L.	Lynn

Heffernan, David A., Navy ..... Allston  
 Heffernan, Dennis W. .... Holliston  
 Hegarty, Joseph G. .... Boston  
 Henderson, George D. .... Holyoke  
 Hewett, Arthur J. .... Newburyport  
 Heywood, Nathaniel J. .... Willimansett  
 Hibben, Freeman H. .... Brookline  
 Hicks, George H., Jr. .... Fall River  
 Higginbotham, Fred A. .... Watertown  
 Higgins, George V. .... Randolph  
 Hill, Ernest L. .... Millis  
 Hilton, John J. .... Lawrence  
 Hiltbold, Werner ..... Easthampton  
 Hinehey, Richard ..... Waltham  
 Hinchliffe, Frederick ..... Cohasset  
 Hirsch, Henry L. .... Springfield  
 Hodgdon, Frank W., Jr. .... Arlington  
 Hodgkins, Edward M. .... Dorchester  
 Hodskins, Edward B. .... Bernardston  
 Hodskins, Morgan B. .... Palmer  
 Hoffman, Morris ..... Boston  
 Hoitt, Charles L. .... Lynn  
*Holbrook, Bradbury* ..... Waltham  
 Holbrook, Charles A. .... Haverhill  
 Holden, Nebuther ..... Whately  
 Holland, Hubert T. .... Jamaica Plain  
 Holland, William T. .... West Roxbury  
 Hollings, Charles B. .... Boston  
 Holmes, Arthur B. .... Kingston  
 Holmes, F. G., Navy ..... Roxbury  
 Holzer, William F. .... Winchendon  
 Homans, John ..... Boston  
 Hooker, Sanford B. .... Boston  
 Hopkins, Bertrand H. .... Ayer  
 Hopkins, Lawrence P., Navy ..... Somerville  
 Hopkins, Ralph H. .... Boston  
 Horner, Albert A., Jr. .... Boston  
 Horrax, Gilbert ..... Boston  
 Horrigan, Arthur J. .... Holyoke  
 Horton, Waldo, Navy ..... Boston  
 Hosley, Walter A. .... Springfield  
 Houston, David W., Jr. .... Boston  
 Howard, Frederic H. .... Williamstown  
 Howard, Harvey J. .... Malden  
 Howard, Perez B. .... Newtonville  
 Howe, George P., Died in service .... Boston  
 Howe, Walter C. .... Boston  
*Howes, Willard B.* ..... Framingham  
 Hoyt, Dixi G. .... Leominster  
 Hubbard, Joshua C. .... Boston  
 Hubbard, R. E., Navy ..... Hatfield  
 Hudson, Carl B., Died in service. .... Boston  
 Hughes, Edgar H. .... Northampton  
 Hull, Eugene F., Died in service .... W. Stockbridge  
 Hunt, Ernest L. .... Worcester  
 Hunt, Robert B. .... Arlington  
 Hunt, William E. .... Bridgewater  
 Hunt, Wilson E. .... Malden  
 Hurd, Albert G. .... Millbury  
 Hurley, Daniel J. .... Charlestown  
 Hussey, Charles B. .... Franklin  
 Hussey, Earle B. .... Fall River  
 Hussey, Edward J. .... Holyoke

Hutchins, Henry T. .... Newton Center  
 Hutchinson, Charles M. .... Cambridge  
 Hayek, Clifford J. .... W. Brookfield  
 Hyde, Harold V. .... Boston  
 Hyman, Clarence H. .... Boston

## I

Isley, Frederick R. .... Medford  
 Ireland, Allen G., Navy ..... Arlington  
 Irving, Frederick C. .... Boston  
 Irwin, Gratian G., Navy ..... South Hadley Falls

## J

Jackson, Arthur M. .... Boston  
 Jackson, Howard B., Died in service .. Melrose  
 Jackson, Howard L. .... W. Springfield  
 Jackson, John P. .... Fall River  
 Jackson, Sumner W. .... Boston  
 Jacobson, Victor C. .... Boston  
 James, Arthur P. .... Boston  
 Janes, Benjamin F. .... Northampton  
 Janney, James C. .... Roxbury  
 Jenkins, Thomas L. .... Topsfield  
 Jennings, C. H., Navy ..... Fitchburg  
 Jennings, John G. .... Auburndale  
 Jensen, William C. .... N. Reading  
 Jessaman, Leon W. .... Framingham  
 Jewett, Everett P., Navy ..... Gardner  
 Jewett, Howard W. .... Lowell  
 Jillson, Franklin C. .... West Roxbury  
 Jillson, Walter A. .... Westboro  
 Johnson, Alfred E., Jr. .... Greenfield  
 Johnson, Erik St. J. .... New Bedford  
 Johnson, Harold A. .... Lynn  
 Johnson, Herbert L. .... Roxbury  
 Johnson, J. B. Albert ..... Lowell  
 Johnson, Kenneth ..... Pittsfield  
 Johnson, Leighton ..... Norwood  
 Johnson, Lewis W., Navy ..... Greenfield  
 Johnson, Peer P. .... Beverly  
 Johnston, Clyde C. .... Springfield  
 Johnston, James S. .... Boston  
*Johnston, William* ..... Dorchester  
*Jones, Basil B.* ..... Boston  
 Jones, Daniel F. .... Boston  
 Jones, Frank L. .... Chatham  
 Jones, Fred D. .... Springfield  
 Jones, Frederick E. .... Quincy  
 Jones, Glenn I. .... Ayer  
 Jones, Raymond C. .... Fitchburg  
 Jones, Robert L. .... Lowell  
 Jones, Thomas P. .... Roxbury  
*Jordan, John F.* ..... Peabody  
 Jordan, Michael M. .... Westboro  
 Joslin, Elliott P. .... Boston  
 Joslyn, Arthur E. .... Lynn  
 Joutett, Fred R. .... Cambridge  
 Judd, Ernest H. .... Springfield  
 Judkins, Charles L. M. .... Lynn

## K

Kane, William V. .... Lynn  
 Kaplovitch, Henry ..... Haverhill  
 Kau, En Young ..... Boston



Kauffman, Arnold B. ....	Boston
Kauffman, Morris F. ....	Norwood
Kauffmann, Samuel B. ....	Fall River
Kearney, Henry J. ....	Everett
Kearney, John H. ....	Fitchburg
Kearney, Joseph P. ....	Lowell
Keegan, John J., Navy ....	Boston
Keenan, George F. ....	Brighton
Keenan, James A. ....	Boston
Kelleher, Simon B. ....	Cambridge
Kelley, Robert E. S., Navy ....	Mattapan
Kellogg, Foster S., Red Cross ....	Boston
Kelly, John J. ....	Marlboro
<i>Kelly, John M.</i> ....	Dorchester
Kemmerer, Theodore W. ....	Boston
Kemp, H. M. ....	Greenfield
Kemp, Lysander S. ....	Canton
Kendall, Miner R. ....	Boston
Kennedy, Thomas J., Navy ....	South Hadley
Kenney, Clarence B. ....	Winchendon
<i>Kenney, Thomas F.</i> ....	Worcester
Kenney, Thomas H. ....	Northampton
<i>Keown, James A.</i> ....	Lynn
Kopler, Charles O. ....	Boston
Kerr, William J. ....	Boston
<i>Kerrigan, Joseph H.</i> ....	Stonham
Kewer, Leo T. ....	Waverley
Kibby, Sydney V. ....	Chelsea
Kilroy, Philip ....	Springfield
King, Alfred E. ....	Watertown
King, Donald S. ....	Boston
King, Edward ....	Boston
King, Frederick A. ....	Boston
King, Nicholas J. ....	Roslindale
Kinnicutt, Roger ....	Worcester
Kinsley, William G. ....	Boston
<i>Kirby, H. C.</i> ....	New Bedford
Kirkpatrick, George H. ....	Lynn
Kirkwood, Allan S. ....	Newton Center
Kissock, Robert J. ....	Boston
Klein, Armin ....	Boston
Knowles, Edward A. ....	Medford
Knowles, William F. ....	West Newton
Knowlton, Edward A. ....	Holyoke
Koefod, Hilmar O. ....	Boston
<i>Konikow, Moses J.</i> ....	Roxbury
Krasnye, John F. ....	Lowell
Kreutzmann, Henry A. R. ....	Boston

## L

Lacey, Walter H. ....	Boston
Laczynski, Francis S. ....	Holyoke
Ladd, Maynard, Red Cross ....	Boston
Lafortune, W. T. ....	Fitchburg
Lahey, Frank H. ....	Boston
Lake, LaFayette ....	Cambridge
LaLiberté, Elie J. ....	Fall River
Lally, Francis H. ....	Milford
Lally, William J. ....	Pittsfield
Lambert, John H. ....	Lowell
Lancaster, Walter B. ....	Brookline
<i>Landers, Thornton A.</i> ....	Somerville
Lane, Clarence G. ....	Woburn
Lane, Clayton R. ....	Fitchburg

Lane, John W. ....	Boston
Lane, Walter A. ....	Milton
Langman, Thomas H. ....	Boston
Lanois, Esdras J., Navy ....	Northboro
Lanpher, Howard A. ....	Chester
LaRivière, Evariste ....	New Bedford
LaRoche, Arthur H. ....	Springfield
Latham, Benoni M. ....	Mansfield
Lawrence, Joseph H. ....	Brockton
Lawlor, James F. ....	Beverly
Lawrence, Charles H. ....	Brookline
Lawrence, Howard F., Navy ....	Falmouth
Lazarus, Louis ....	Worcester
Leary, Alfred J. ....	Boston
Leavitt, Frank C. ....	Belmont
Leavitt, Peirce H. ....	Cambridge
LeBoeuf, Joseph P. ....	Fall River
LeClair, H. H., Navy ....	New Bedford
Ledbury, John W., Jr. ....	Uxbridge
Lee, Roger I. ....	Cambridge
Lee, Wesley T. ....	Brookline
Leib, Edwin Roy ....	Worcester
Leith, Richard B. ....	Lawrence
LeLacheur, Ellis S. ....	W. Bridgewater
Leland, George A., Jr. ....	Boston
Leland, Harold L. ....	Lowell
Lemaire, Willard W. ....	Worcester
Lemaire, William F. ....	Lynn
Lemay, Alfred M. ....	Brockton
Lena, Hugh F., Navy ....	Boston
Leutine, Gaspare E. ....	Hanson
Leonard, William J. ....	Springfield
Levek, Joseph A. ....	Lawrence
Leverton, Reuben L. ....	Boston
Levin, Nathan N. ....	Boston
<i>Lewis, Arthur C.</i> ....	Fall River
Lewis, Elisha S. ....	Springfield
Lewis, Frank E. ....	Nantucket
Libby, J. Herbert ....	E. Weymouth
Liberti, Angelo ....	Boston
Light, Emmet E. ....	E. Longmeadow
Limauro, Louis H. ....	Lynn
Lincoln, George C. ....	Worcester
Lincoln, Merrick ....	Worcester
<i>Lindquist, Carl A.</i> ....	Boston
Lindsay, John C., Navy ....	Tewksbury
Lindsey, John H. ....	Fall River
Lipsitt, Charles S., Navy ....	New Bedford
Little, Abby N., Red Cross ....	Newburyport
Little, George T. ....	Uxbridge
Littlewood, Thomas ....	Pittsfield
Livingston, Clarence B. ....	Lowell
Ijungberg, David G. ....	Worcester
Loewe, Walter R., Navy ....	Chelsea
Long, Rufus W. ....	Boston
Lord, Frederick T., Red Cross ....	Boston
Lord, Robert M. ....	Boston
Loring, Robert G. ....	Boston
Lougee, John L. ....	Boston
Lovesey, Burton E. ....	Lowell
Lovett, Robert W. ....	Boston
Lowe, Thomas S. ....	Ft. Rodman
Lowe, W. R., Navy ....	Dorchester

Lowney, Dennis J.	New Bedford
Lowry, Franklin P.	Newton
Lucas, Julian D.	Roxbury
Luce, Dean S.	Canton
<i>Luftig, Jacob</i>	Roxbury
Lund, Fred B.	Boston
Lupien, Henry J.	Brockton
Lurie, Moses H.	Roxbury
Lurier, Israel	Worcester
Lyman, Henry	Boston
Lynch, Charles F.	Springfield
Lynch, Henry E.	Holyoke
Lynch, Joseph M.	Boston
Lyon, Arthur B.	Poston
Lyon, James A.	Poston

## M

MacAusland, Andrew R.	Boston
MacDonald, D. F.	Taunton
<i>MacFadyen, J. A.</i>	Worcester
MacIntyre, William A.	N. Grafton
MacIver, George A.	Boston
MacKay, William H.	Worcester
MacKnight, Richard P.	Fall River
MacKnight, William F.	Fall River
MacLeod, Harry F.	Dorchester
MacMichael, Earl H.	Malden
MacMillan, Alexander S.	Boston
MacNaughton, Wallace F.	Boston
MacPhail, John G.	Navy
MacPherson, Donald J.	Boston
McAlevy, George W.	Red Cross
<i>McAllister, Frederick D.</i>	Lawrence
McAuslan, James L.	Gardner
McBain, William H.	Malden
McCaffrey, Jerome J.	Attleboro
McCann, Charles D.	Brockton
McCann, William S.	Boston
McCarthy, Charles A.	Navy
<i>McCarthy, Charles D., Jr.</i>	Lawrence
McCarthy, Eugene J.	Malden
McCarthy, Louis F.	Malden
McCarthy, Patrick T.	Boston
McCauley, A. A.	Boston
McClure, C. W.	Boston
McConnell, David J.	Greenfield
McCormack, John S.	Jamaica Plain
McCormick, John J.	Woburn
McCormick, William A.	New Bedford
McCruden, Francis H.	Boston
McDonald, Frederick L.	Red Cross
McDonald, Harry L.	Attleboro
McDonald, John F.	Navy
McDonald William J.	Brookline
McEadden, James F.	Foxborough
<i>McFee, William D.</i>	Haverhill
<i>McGann, Pierce P.</i>	Somerville
McGillivuddy, Cornelius J.	Boston
McGillivuddy, J. T.	Worcester
McGraw, Andrew J.	Taunton
McGuire, Joseph H.	Boston
McKeechie, Fred J.	Springfield
McKenna, Peter G.	Canton
McLaughlin, Arthur O.	Haverhill

McLaughlin, English N.	Newton
McLean, John A.	W. Somerville
<i>McMahon, Francis J.</i>	Brookline
McMahon, M. F.	Worcester
McMahon, William T.	Pittsfield
McMahon, William H.	Jamaica Plain
McNamara, John J.	Taunton
McNamara, John J.	Brockton
McPherson, George E.	Medfield
McPherson, William E.	Canton
McQuade, Lewis S.	Dorchester
Mcquesten, Philip	Boston
McVey, F. J.	Dorchester
McWilliams, Norman B.	Williamstown
Mabon, Thomas McC.	Boston
Macaluso, Anthony, Navy	Dorchester
Macomber, Donald	West Newton
<i>Magie, Burtis</i>	Boston
<i>Maguire, John F.</i>	Jamaica Plain
Mahoney, Daniel F.	Boston
Mahoney, John F.	New Bedford
Mahoney, John L.	Boston
Mahoney, Matthew P.	Lowell
Mahoney, Walter F.	Westboro
Mahony, Francis R.	Lowell
Mains, Charles F.	Ashmont
Mains, Herbert L.	Danvers
Malone, Charles	Jamaica Plain
Maloney, John M.	Springfield
Malonson, James H.	Gloucester
Mann, Henry L.	Boston
Mannix, Louis E.	Chicopee Falls
Mara, Joseph L.	Brockton
Marble, Henry C.	Boston
<i>Marcy, Henry O., Jr.</i>	Newton
Marlow, Searle B.	Boston
Marney, Samuel L.	Chelsea
Marr, Myron W.	Red Cross
Marr, Robert M.	Westfield
Marshall, John R.	Navy
Marston, Warren W.	Newton
Martin, David L.	Dorchester
Martin, Harry C.	Springfield
Martin, John F.	Boston
Marvin, Frank W.	Boston
Maskell, Leonard J.	Newton
Mason, Gilbert M.	Boston
Mason, Nathaniel R.	Boston
Mather, John A.	Navy
Mathes, Roy W.	Navy
Mathewson, Frank W.	New Bedford
Maxfield, George H.	Chelsea
May, James V.	N. Grafton
<i>May, John B.</i>	Coliasset
May, John S.	Roxbury
Mayhew, Orland S.	Vineyard H'v'n
Maynard, Herbert E.	Winchester
Mead, Frederick A.	Williamsett
Means, James H.	Boston
Medalia, David B.	Boston
Medalia, Leon S.	Boston
Medlar, Edgar M.	Boston
Mesnan, Patrick J.	Lowell

Merrill, Adelbert S. . . . . Boston  
 Merrill, Charles H. . . . . Lynn  
 Merrill, Clyde H. . . . . Marlboro  
 Merrill, Everett A. . . . . E. Lynn  
 Merrill, William H. . . . . Lawrence  
 Merritt, Edward L., Navy . . . . . Fall River  
 Merritt, Robert E. . . . . Wollaston  
 Merritt, Victor S. . . . . Springfield  
 Meserve, Edwin A. . . . . Watertown  
 Messer, Edward R., Navy . . . . . Pittsfield  
 Metcalf, Ben H. . . . . Winthrop  
 Metzger, Butler . . . . . Lynn  
 Meyer, Carl E. . . . . Chicopee  
 Meyer, Edward J. . . . . Somerville  
 Miller, Percy P. . . . . Harwich  
 Miller, Richard H. . . . . Boston  
 Millet, John A. P. . . . . Boston  
 Millett, Frank A. . . . . Greenfield  
 Milot, Joseph D. . . . . Fall River  
 Milot, Wilfrid F. . . . . Attleboro  
 Mills, Alfred E. . . . . Somerville  
*Miniter, Francis G., Navy* . . . . . Medford  
 Mitchell, Frank W. A. . . . . E. Lynn  
 Mixer, Charles G. . . . . Boston  
 Mixer, Samuel J. . . . . Boston  
 Mixer, William J. . . . . Boston  
 Moline, Charles . . . . . Sunderland  
 Mollica, Zachary A. . . . . Boston  
 Moloney, J. B., Navy . . . . . South Boston  
 Monahan, Edward J. . . . . Revere  
 Moncrieff, William A. . . . . New Bedford  
 Montgomery, James B. . . . . Boston  
 Moore, Frederick P. . . . . East Norfolk  
 Moore, George A. . . . . Brockton  
 Moore, Howard . . . . . Newton  
 Mooring, Scott W. . . . . Gloucester  
 Moran, Andrew C. . . . . Fall River  
 Moran, Charles L., Navy . . . . . Roxbury  
*Moran, Richard A.* . . . . Fitchburg  
 Moriarty, Patrick M. . . . . Springfield  
 Morin, Romeo J. . . . . Ayer  
 Morris, Ernest M. . . . . Fall River  
 Morris, Samuel L., Jr. . . . . Boston  
 Morrison, Lawrie B. . . . . Roxbury  
 Morrison, William R. . . . . Boston  
 Morriss, William S., Died in service, Fall River  
 Morse, Almon G. . . . . Boston  
 Morse, Frank L. . . . . Somerville  
 Morton, John J. . . . . Boston  
 Mosher, Harris P. . . . . Boston  
 Mossman, George . . . . . Westminster  
 Mott, George E., Navy . . . . . Lynn  
 Moulton, Allen T. . . . . Roxbury  
 Moulton, Starr A. . . . . Winthrop  
*Muteahy, William E.* . . . . Springfield  
*Mulhern, Joseph P.* . . . . Worcester  
 Munro, Donald . . . . . Milton  
 Murphy, Daniel F. . . . . Beverly  
*Murphy, Edward F.* . . . . Roxbury  
 Murphy, Frank A. . . . . Taunton  
 Murphy, James M. . . . . Palmer  
 Murphy, John J. . . . . Cambridge  
 Murphy, John M. . . . . Brockton

Murphy, Joseph L. . . . . Taunton  
 Murphy, Thomas William . . . . . Lawrence  
*Myers, Franklin A.* . . . . Boston  
 Myrick, Alfred W. . . . . Randolph

## N

Naumann, Albert A. . . . . Springfield  
 Neal, Kemp P. . . . . Boston  
 Nevers, Harry H. . . . . Lawrence  
*Nechall, Avery L.* . . . . W. Lynn  
 Newman, Leon . . . . . Jamaica Plain  
 Newton, Edward R., Navy . . . . . Somerville  
 Newton, Roland S. . . . . Westborough  
 Newton, William C., Navy . . . . . Revere  
 Nichols, Andrew, 3rd . . . . . Hathorne  
 Nichols, Edward H. . . . . Boston  
 Nichols, Nelson E. . . . . Boston  
*Nichols, Paul F.* . . . . Malden  
 Nielson, Edwin B. . . . . West Newton  
 Nightingale, James . . . . . Worcester  
 Nisbet, Douglas H. . . . . Boston  
 Noel, Henry L. . . . . Lexington  
 Noonan, William A., Navy . . . . . Cambridge  
 Norbury, Frank G. . . . . Boston  
 Norris, Rolf C. . . . . Methuen  
 Norton, Thomas J. . . . . Pittsfield  
 Nowell, Howard W. . . . . Boston  
*Noyes, John R.* . . . . Brockton  
 Noyes, Nathaniel K. . . . . Fuxbury  
 Nye, Robert N. . . . . Springfield

## O

Ober, Frank R. . . . . Boston  
 Ober, Ralph B. . . . . Springfield  
 Oberg, Frank T. . . . . Worcester  
*O'Brien, Charles T.* . . . . Woburn  
 O'Brien, D. P. . . . . New Bedford  
 O'Brien, Francis E., Navy . . . . . Northampton  
*O'Brien, Fred W.* . . . . Boston  
*O'Brien, John F.* . . . . Fall River  
 O'Brien, Thomas J., Navy . . . . . Westboro  
 O'Connor, Arthur M. . . . . Housatonic  
 O'Connor, Dennis F. . . . . Worcester  
 O'Connor, Patrick H. . . . . New Bedford  
 O'Connor, William H., Navy . . . . . Dorchester  
 O'Day, Sylvester F. . . . . Ft. Andrews  
 O'Dea, Patrick J. . . . . Attleboro  
 Odeneal, Thomas H. . . . . Beverly  
 O'Donnell, John J. . . . . Boston  
*Oeser, Paul R.* . . . . Lawrence  
 Ohler, William R. . . . . Boston  
 O'Keefe, Edward S. . . . . Lynn  
 Olin, Harry . . . . . Roxbury  
 Oliver, Everard L. . . . . Westwood  
*O'Malley, Edward F.* . . . . Fitchburg  
*O'Mara, John W.* . . . . Worcester  
 O'Neil, Richard F. . . . . Boston  
 Ordway, Charles A., Died in service . . . . . Fverett  
 O'Reilly, Francis A. . . . . Lawrence  
 Orr, S. Sanford . . . . . Weston  
 Osborn, Stanley H. . . . . Cambridge  
 Osgood, George . . . . . Cohasset  
 Osgood, Howard . . . . . Boston  
 Osgood, Robert B. . . . . Boston

O'Sullivan, Francis A. .... Lowell  
*Otis, Edward O.* ..... Boston  
*Otis, Israel S., Navy* ..... Chelsea  
*Otis, Walter J.* ..... Waverley  
 Overholser, Winfred ..... Westboro  
 Overlander, John C. .... Springfield  
 Owen, Albert S. .... Framingham

## P

Packard, George B., Jr. .... Boston  
 Paglia, Jeremiah J. .... Worcester  
*Paine, Alonzo K.* ..... Boston  
 Pailey, Francis W. .... Boston  
 Palmer, Walter W. .... Boston  
 Papen, George W. .... E. Boston  
 Papoulacos, Panagiotis M. .... Boston  
 Parcher, George C. .... Saugus  
 Park, James H., Jr. .... Boston  
 Parker, Charles C., Jr. .... Roxbury  
 Parker, Frederick, Jr. .... Boston  
 Parker, Harold F. .... Boston  
 Parker, Raymond B. .... Winthrop  
 Parker, Willard S. .... Boston  
 Parkhurst, Guy McM. .... Cambridge  
 Parlow, George G. .... Fall River  
 Parris, Roland O. .... Brookline  
 Partington, Cyrus B. .... Fall River  
 Pascoe, James B. .... Hull  
 Pastene, Albert A. .... Boston  
 Paul, Benjamin D. .... Boston  
 Payne, James H., Navy .... Boston  
 Peabody, Charles W. .... Boston  
 Peabody, Francis W. .... Cambridge  
*Pearce, Arthur C.* ..... Boston  
 Pease, Charles W. .... Needham  
 Pease, Lewis W. .... Weymouth  
 Peck, Martin W. .... Lynn  
 Peck, Roy H. .... Springfield  
 Peirce, George A. .... Tewksbury  
*Pelletier, J. E.* ..... Worcester  
 Penhallow, Dunlap P. .... Boston  
 Percy, Karlton G., Red Cross .... Brookline  
*Perkins, George E.* ..... Boston  
 Perkins, Hamilton C. .... South Boston  
 Perkins, Roy S. .... Lowell  
 Perry, Arthur P. .... Jamaica Plain  
 Perry, Charles E. .... Northampton  
 Perry, Herbert B. .... Northampton  
 Perry, Walter L. .... Worcester  
 Persons, Carl C. .... New Bedford  
*Peter, Alphonse* ..... Newburyport  
 Peters, John D. .... Gt. Barrington  
 Peterson, Arthur F. .... Pittsfield  
 Pettengill, Warren M. .... Boston  
 Petty, John A. .... Brockton  
 Pfeiffer, Albert ..... Lexington  
*Phaneuf, Josephat S.* ..... Brockton  
 Phaneuf, Louis E. .... Boston  
 Phelan, Edward F., Died in service .... N. Brookfield  
 Philbrick, Roscoe H. .... E. Northfield  
 Phillips, John C. .... Wenham  
 Phillips, Cadis ..... Boston  
 Pierce, Appleton H. .... Leominster  
 Pierce, Bradford H., Navy .... Cambridge

Pierce, Reuel A. .... Canton  
 Pike, Forrest F. .... Melrose  
 Pillsbury, Ernest D. .... Somerville  
 Piper, Frank ..... Boston  
 Pitcher, Hervey B. .... Fitchburg  
 Plouffe, B. L. .... Webster  
 Plumb, Darley G. .... Melrose  
 Plummer, Frederic H. .... Chelsea  
 Poirier, George H. .... Boston  
*Pomeroy, Carl T.* ..... Melrose Hlds.  
 Pomeroy, Harris S. .... Peabody  
 Pond, Dallas, Navy ..... Chelsea  
 Porter, Charles T. .... Boston  
 Pote, Leonard H. .... Somerville  
 Potter, A. Carleton ..... Cambridge  
*Powers, George H.* ..... Boston  
 Powers, Harris E. .... Boston  
 Pratt, Emily A., Red Cross .... Boston  
 Pratt, Ezekiel ..... Arlington  
 Pratt, Joseph H. .... Brookline  
 Prentice, Donald D., Navy .... Pittsfield  
 Priest, Herbert B. .... Ayer  
 Proctor, Grover C. .... Boston  
 Proctor, Thomas M. .... Wrentham  
 Prouty, Albert H. .... N. Brookfield  
 Provost, Raoul G. .... New Bedford  
 Pulsifer, Nathan ..... Lowell  
 Pulsifer, Walter H. .... Whitman  
 Pusknigis, F. B. .... Worcester  
 Putnam, James J., Jr. .... Boston

## Q

Quackenboss, Alexander ..... Boston  
 Quennell, Willard L. .... N. Cambridge  
 Quimby, Howard L. .... Gloucester  
 Quinn, James H. .... Springfield  
 Quirk, Thomas C., Navy .... Watertown  
 Quist, F. Julius ..... Worcester

## R

Rabinovitz, Bernard ..... Springfield  
 Rackemann, Francis M. .... Boston  
 Radding, Moses B. .... Springfield  
*Rader, Oscar J.* ..... Boston  
 Rafferty, Thomas B. .... Lynn  
 Randall, John A., Died in service .... Myricks  
 Rapport, David L. .... Boston  
 Ratley, Arthur A. .... Lawrence  
 Rauser, Raymond ..... Lawrence  
 Raymond, Albert C. .... Worcester  
 Reardon, Daniel B. .... Quincy  
 Redden, William R., Navy .... Boston  
 Reed, Carlisle ..... Boston  
*Reed, Victor A.* ..... Lawrence  
 Reese, John A. .... Boston  
 Regan, Edward F. .... Framingham  
 Regan, James J., Navy ..... Dorchester  
 Regan, William F., Navy ..... Chelsea  
*Regan, William H.* ..... Cambridge  
 Reid, William D. .... Newton  
 Rice, Allen G. .... Springfield  
 Rice, George A. .... Boston  
 Rice, Robert A. .... Fitchburg  
 Richardson, Edward P. .... Boston

Richardson, Ira W. ....	Wakefield	St. Clair, Austin E. ....	Framingham
Richmond, Ernest D. ....	Reading	St. George, Wilfred M. ....	Holyoke
Riggs, Austin F. ....	Stockbridge	Salerno, Louis F. ....	East Boston
Riley, Augustus ....	Boston	Salmon, Charles A. ....	Worcester
Riley, Charles A. ....	Boston	Sanborn, Frederick R. ....	Lynn
Riley, Joseph H. H. ....	Boston	Sanborn, John W. ....	Roxbury
Ring, Arthur H. ....	Arlington Hts.	Sandler, Frank F. ....	Revere
Riordan, Arthur H., Navy ....	Indian Orchard	Saphirstein, Hyman, Navy ....	Boston
Ripley, Harold W. ....	Boston	Sargent, Arthur ....	Boston
Ripley, Horace G. ....	Taunton	Sarno, Avery H., Navy ....	Boston
Risley, Edward H. ....	Boston	Savage, Joseph C. ....	Boston
Risley, John N., Navy ....	New Bedford	Sawyer, Alpha R. ....	Roslindale
Ritter, Henry ....	Springfield	Sawyer, Edward J. ....	Boston
Robb, Hunter ....	Winchester	Sayles, Joseph B. ....	Taunton
Robert, George C. ....	Holyoke	Scales, Robert B. ....	Dorchester
Roberts, Wyatt S. ....	Boston	Scanlan, Joseph M. ....	Lawrence
Robertson, Charles W. ....	North Dana	Scanlan, Thomas J. ....	Dorchester
Robertson, Oswald H. ....	New Bedford	Scannell, David D. ....	Boston
Robey, William H., Jr. ....	Boston	Scannell, Edward J. ....	Chelsea
Robie, Walter F. ....	Baldwinsville	Schadt, George L. ....	Springfield
Robinson, Henry A. ....	Marlboro	Schillander, Carl A. ....	Springfield
Rochford, Richard A. ....	Springfield	Schirmer, J. Walter ....	Boston
Rock, John C. ....	Marlboro	Schley, William S. ....	Lynn
Rockwell, Herbert G. ....	Amherst	Schnack, Adolph G. C. ....	Cambridge
Rockwell, J. Arnold ....	Cambridge	Schneider, Harry A. ....	Pittsfield
Rockwell, Llewelyn H. ....	Roxbury	Schofield, Otho L. ....	Wellesley
Roderick, Anthony J. ....	New Bedford	Schofield, Roger W. ....	Worcester
Roderick, Charles E. ....	Taunton	Schwartz, George H. ....	Boston
Rodger, James Y. ....	Lowell	Scott, Norman M. ....	Boston
Rodrick, Albert F. ....	Boston	Sears, Frederick M., Navy ....	Dorchester
Rogers, Edmund A. ....	Brookline	Sears, Harry E. ....	Beverly
Rogers, John A. ....	Lowell	Secord, Walter N., Navy ....	Newton
Rogers, Lester B. ....	Orange	Sedgley, Frank R. ....	West Roxbury
Rogers, Mark H. ....	Bolmont	Segal, Joseph ....	Boston
Rogers, Orville F., Jr. ....	Dorchester	Segal, Samuel, Jr., Navy ....	Haverhill
Rollins, Francis T. ....	East Boston	Segall, Samuel K. ....	New Bedford
Rood, Adolphus D. ....	Whitman	Seibels, Robert E. ....	Springfield
Root, James H. ....	Boston	Sellards, Andrew W. ....	Boston
Root, Raymond R. ....	Georgetown	Sellaw, Robert C. ....	New Marlboro
Rosen, Edward ....	Cambridge	Senechal, Raymond E. ....	New Bedford
Rosenan, Milton J., Navy ....	Brookline	Sewall, C. Wesley ....	Jamaica Plain
Rosenberg, Nathan ....	Boston	Sexton, Frank J. ....	Brookline
Rosser, Curtice M., Navy ....	Boston	Seymour, Malcolm ....	Boston
Rowe, Carlton A. ....	Milton	Seymour, Wilmarth Y. ....	Bridgewater
Rowley, Philip W., Navy ....	Gloucester	Shapiro, Albert A. ....	Boston
Rudman, Benjamin W. ....	Boston	Sharp, Robert G., Red Cross ....	Boston
Rudman, Israel E. ....	New Bedford	Sharry, Charles F. ....	Somerville
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Shurtliff, Percy A. ....	Blandford
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Simmons, Hugh L. ....	Worcester
Simmons, Ralph H. ....	Fall River
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Simonds, Frederick A. ....	Cambridge
Simons, Sigmund, Navy ....	Chelsea
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Sims, Frederick R. ....	Melrose
Sinclair, Donald B. ....	Williamstown
Sise, Lincoln F., Navy ....	Medford
Sisson, Warren R. ....	Boston
Skirball, Joseph J. ....	Boston
Skirball, Louis I. ....	Revere
<i>State, Amos W.</i> ....	Springfield
Sleeper, Frank W., Navy ....	Dorchester
Small, Albert E. ....	Melrose
Small, Ernest W. ....	Belmont
Smith, Alfred C. ....	Brockton
Smith, Edwin E. ....	Quincy
Smith, Edwin W. ....	Newton
Smith, Erdix T. ....	Springfield
Smith, Ernest E. ....	Webster
Smith, George G. ....	Boston
<i>Smith, Hervey L.</i> ....	Springfield
Smith, John J. ....	Cambridge
Snow, Frank W. ....	Newburyport
Solomon, Harry C. ....	Jamaica Plain
Solomon, Sidney J. ....	Boston
Sontor, William N. ....	Boston
Sonther, Robert F. ....	Boston
Sowles, Horace K. ....	Boston
Spaulding, John D. ....	Boston
Spear, Lewis M. ....	Boston
Spellman, Martin H. ....	Whitman
Spencer, Oscar L. ....	Lynn
Spillman, Ramsay, Navy ....	Boston
Spooner, Lesley H. ....	Boston
Spruit, Charles B. ....	Poston
Stantz, Karl S. ....	Worcester
Stacey, Winthrop D. ....	Charlestown
Stack, John J. ....	Boston
Stansfield, Clarence W. ....	Fall River
Stansfield, Oliver H., British Service ....	Worcester
Stanwood, Frederic A. ....	Wellesley Hills
Stapleton, Willard P. ....	Worcester
Stearns, Albert W., Navy ....	Billerica
Stearns, Robert T. ....	Mattapan
Steele, George L. ....	W. Springfield
Stern, Newton S. ....	Jamaica Plain
Stetson, Frank E. ....	New Bedford
Stevens, Charles B. ....	Worcester
Stevens, Franklin A. ....	Boston
Stevens, Harold W. ....	Easton
Stevens, Henry B. ....	West Roxbury
Stevens, Horace P., Navy ....	Cambridge
Stevens, William R. ....	Arlington
Stewart, Harrison M. ....	Pittsfield
Stick, Henry L. ....	Worcester
Stickney, Whitman G. ....	Beverly
Stiles, Fred M. ....	Waltham
Stoddard, James K. ....	Boston
Stoddard, James L. ....	Boston
Stoddard, Mortimer I. ....	Springfield
Stone, George H. ....	Roslindale
Stone, James S. ....	Boston
Stone, Thomas N. ....	Haverhill
Stowe, Irving E., Navy ....	Brookline
Strahmann, Louis ....	Boston
<i>Strawmer, Myron A.</i> ....	Jamaica Plain
Street, Charles E. ....	Springfield
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<i>Streeter, Howard J.</i> ....	Pittsfield
Streeter, John F. ....	Springfield
Strong, Richard P. ....	Boston
Sturgis, Cyrus C. ....	Boston
Sturgis, Walter H. ....	Hull
<i>Sughrue, Dennis F.</i> ....	Roxbury
Sullivan, Andrew J., Navy ....	Brockton
Sullivan, Arthur J. ....	Fall River
Sullivan, Daniel J. ....	South Boston
Sullivan, Edward C. ....	Springfield
Sullivan, John A. ....	Pittsfield
Sullivan, Joseph C. ....	Webster
Sumner, Harry H. ....	Lowell
Suris, Joseph K. ....	Brookline
Sussler, David ....	Dorchester
Swan, Laurence C. ....	Beverly
Sweeney, Edward J. ....	Springfield
Sweeney, John G. ....	North Cohasset
Sweeney, Michael T. ....	Quincy
Swope, Oscar C. ....	Kingston
<i>Swvester, Charles P.</i> ....	Boston

## T

Taber, Thomas H., Navy ....	New Bedford
Tabor, Edward O. ....	Lowell
Tate, Harry J. ....	Pittsfield
Taylor, John F. ....	East Boston
Taylor, John H. ....	Cambridge
Taylor, Roy A. ....	Waltham
<i>Taylor, William J.</i> ....	East Dedham
Teague, Oscar ....	Boston
Tellier, Ernest ....	N. Attleboro
<i>Temple, William F., Jr.</i> ....	Boston
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Tetrauit, Charles A. ....	Southbridge
Thaxter, Langdon T. ....	Poston
Thom, Douglas A. ....	Worcester
Thomas, Abraham F. ....	Newburyport
Thomas, Arthur W. ....	Boston
Thomas, Elmer F. ....	Northampton
Thomas, Harold ....	Wollaston
Thomas, Henry M., Jr. ....	Boston
Thomas, John J. ....	Boston

Thomas, William K. S. ....	Cambridge
Thomson, John B. ....	Pittsfield
Thompson, Charles E. P. ....	Fairhaven
Thompson, Richard H. ....	Malden
Tierney, Thomas F. ....	Hudson
Tinkham, Oliver G. ....	Boston
Tobey, George L., Jr. ....	Boston
Tobey, Harold G. ....	Boston
Tonah, Everett H. ....	Cambridge
Tooker, Harold C. ....	Boston
Topham, John J. ....	Lowell
Torbert, James R. ....	Boston
Towne, Edward B. ....	Boston
Townsend, David ....	Brookline
Tracy, John M. ....	Springfield
Trask, Harry W. ....	W. Boylston
Trask, John W. ....	Lynn
Treanor, John P. ....	Dorchester
Treichler, Albert J. ....	Springfield
Trickey, Charles L., Navy ....	Tewksbury
Truesdale, Philemon E. ....	Fall River
Trueman, Nelson G. ....	Salem
Tucker, Cassell C. ....	Boston
Tucker, Willis L. ....	Millsdale
Tully, George L., Navy ....	South Boston
Tully, George W. ....	Southbridge
Turner, Henry C., Jr. ....	Norwood
Turner, Ralph W. ....	Boston
Turner, William G., Died in service ....	Fall River
Turner, William K. ....	New Bedford
Tuttle, Howard K. ....	South Acton
Twigg, Nial F., Died in service ....	Brockton
Tyler, Winsor M. ....	Lexington

## U

Ullian, Louis J. ....	Boston
Underhill, Samuel G. ....	Lynn
Underwood, George B. ....	North Reading
Upton, Charles L. ....	Shelburne Falls

## V

Valentine, John P. ....	Danvers
Vamvas, Anthony D. ....	Boston
Van Camp, Thomas H. ....	Boston
Van Gorder, George W. ....	Brookline
Van Meter, Abram L. ....	Boston
Van Nijys, Fresenius, Navy ....	Weston
Varney, Elton M. ....	Peabody
Vaughan, Warren T. ....	Boston
Verhoeff, Frederick H. ....	Brookline
Viets, Henry R. ....	Boston
Vinal, Charles R. ....	Montague
Vincent, Beth ....	Boston
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Vose, Samuel N. ....	Boston
Voss, J. William ....	Beverly

## W

Wainshel, Perez ....	Lynn
Walcott, William W., Died in service ....	Natick
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Walker, Melvin H., Jr. ....	Pittsfield
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Walker, Waldo W. ....	W. Somerville
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Ward, John C. ....	Worcester
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Warden, Ralph A. ....	Boston
Warren, Charles F. ....	Amesbury
Warren, John ....	Boston
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Washburn, Frederic A. ....	Boston
Waterhouse, Robert M., Navy ....	Newton
Waters, James E. ....	Gardner
Watkins, Harvey M. ....	Palmer
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Watt, George ....	Worcester
Watts, Henry F. R. ....	Dorchester
Wearn, Joseph T. ....	Boston
Webber, Wolfert G. ....	Needham
Webster, Frederick A. ....	Boston
Webster, John B. ....	New Bedford
Weiser, Walter R. ....	Springfield
Welbourn, Marshall A. ....	Boston
Wellington, Anna C., Red Cross ....	Boston
Wells, Orion V., Died in service ....	Westford
Wentworth, Arthur H., Red Cross ....	Boston
Wentworth, John A. ....	Roxbury
Wesselhoft, Conrad ....	Boston
Wesselhoft, W. F. ....	Boston
West, Frederick O. ....	Woburn
Wetherell, Bryant D. ....	Holyoke
Wheatley, Frank E. ....	N. Abington
Wheatley, Frank G. ....	N. Abington
Wheelton, Thomas F. ....	Boston
Wheat, Harry R. ....	Springfield
Whelan, Charles ....	Uingham
Whelan, Edmund V., Navy ....	Bridgewater
Whipple, George C., Red Cross ....	Cambridge
Whitaker, Harper E., Navy ....	Gloucester
Whitecomb, Clarence A., Navy ....	Malden
White, Frank S. ....	Milford
White, George A. ....	Cambridge
White, Henry A. ....	Taunton
White, John R., Navy ....	Lynn
White, Joseph W., Navy ....	Boston
White, Paul D. ....	Boston
Wickham, Thomas W. ....	Boston
Wiggin, Ralph C. ....	Boston
Wiggin, William L., Red Cross ....	Lowell
Wilbur, George B. ....	Boston
Wilcox, Charles F., Jr. ....	Boston
Wilcox, John M., Navy ....	Brookline
Wilde, Salmon P. ....	New Bedford
Willburt, Sterling E. ....	Boston
Wilkins, George A. ....	Revere
Willey, Walter B., Jr. ....	Brighton
Williams, David L. ....	Boston
Williams, Frank P. ....	Boston
Williams, Fred E. ....	Worcester
Wilson, Charles H. ....	Chelsea
Winslow, Edward S. ....	Easthampton

Wislocki, George B. ....	Boston
Wiswall, Edward H., Died in service ..	Wellesley
Withee, Frederick E. ....	Newton Hts.
Withington, Alfreda B., Red Cross ..	Pittsfield
Withington, Paul R. ....	Boston
Wolff, B. M., Red Cross .....	Boston
Wood, William F. ....	Poston
Woodard, James M. ....	Salem
Woods, Alan C. ....	Boston
Woodworth, John D. R. ....	Jamaica Plain
Woody, Melver .....	Boston
Worcester, Alfred, Red Cross .....	Waltham
Worthington, Arthur M. ....	Dedham
Wright, Charles W. ....	North Adams
Wright, James H. ....	Brookline
Wright, Wade .....	Boston
Wright, Willard L. ....	Boston
Wyant, John .....	Boston
Wyman, Edwin T. ....	Boston
Wyman, John H. ....	Medway

Y

Yeamans, Herbert W. ....	Boston
Yerbury, Charles C. ....	Springfield
Yosoff, Abraham K. ....	Worcester
Young, Edward W. ....	New Bedford
Young, Ernest B. ....	Boston
Young, William B. ....	Cambridge

Z

Zimmerman, Henry .....	Springfield
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### Book Reviews.

*American Red Cross. Textbooks on First Aid.*  
Second Editions. By COLONEL C. LYNCH.  
*Home Hygiene and Care of the Sick.* By  
JANE A. DELANO, R.N. Philadelphia: P.  
Blakiston's Son & Company. 1918.

The American Red Cross has recently endorsed the publication of three useful textbooks, two dealing with first aid, and the third with home hygiene and care of the sick. Of the first aid books, one is for general use and the other has been compiled particularly to fill the need of women who desire to learn how to deal intelligently with ordinary injury and illness. The editions are in part identical, as the essential facts of first aid treatment are always the same; but it has been found advantageous to adapt the information available to the needs of particular classes.

The general edition describes the structure and mechanics of the body, and gives directions for giving aid to persons suffering from shock, sprains, dislocations, fractures, wounds, or from injuries due to heat and cold. Methods of administering artificial respiration, and measures

applicable to more common emergencies are explained. A chapter discussing war first aid is of practical value and also of general interest.

The edition issued primarily for women is similar to the general edition and in it may be found all that is necessary for a woman to know in order to render intelligent first aid treatment. The admirable progress already made in first aid instruction will be carried even further by the publication of these books.

The textbook on home hygiene and care of the sick has been published under the auspices of the Red Cross in order to enable women to prevent much of the sickness arising in the home and community. It is the purpose of this book to make women understand some of the general laws of health, to recognize symptoms in their early stages, to guard against communicable disease, and to render intelligent care to the sick. The section dealing with the care of babies is of particular value. As nearly every woman is called upon to assist in the care of the sick at some time during her life, this book should find its way into every American home.

*A Text-book of Physiology.* By WILLIAM H. HOWELL. Seventh Edition. Philadelphia: The W. B. Saunders Company. 1918. 1059 pages. Price, \$5.00.

Previous editions of this book have been reviewed in the JOURNAL. It has easily held its place for more than a decade as the most symmetrical and inclusive treatise upon the subject by an American author. Inasmuch as this is widely recognized there is little to be said of the current edition beyond the statement that the revision has been careful and extensive. Doctor Howell has a singularly judicial mind; one would find it difficult to discover in his book which are the matters that have chiefly claimed his own attention and to which side he inclines in controversy. His style is clear and agreeable.

Physiology is showing a divisive tendency. For some students the absorbing interest is in the coordination of complex systems. For others it is in the cell—in the reactions of protoplasm. The pursuit of the science in the second case leads into the realm of physical chemistry. Howell's text, on the whole, emphasizes the highly organized mechanism rather than the elementary substance and may, in consequence be termed medical rather than biological. It is contrasted in this respect with such a work as Bayliss' "Principles of General Physiology."

The author's course in citing authorities is to be commended. The number of references is not so great as to be confusing and those which are included open sources of valuable information. The illustrations are numerous and well chosen.



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THURSDAY, AUGUST 7, 1919

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## MASSACHUSETTS PHYSICIANS IN THE WAR.

In this issue is published a list of the Massachusetts physicians who volunteered in the service of their country during the World War. The list was prepared from the card catalogue that was made by the volunteer secretary of the Massachusetts State Committee, Council of National Defense, Medical Section, and her corps of helpers, and was checked by the official files in the offices of the surgeon-generals of the Army and Navy, and the Red Cross at Washington. The total number of names is 1,700. The Directory of the American Medical Association, published in the spring of 1918, gives the total number of physicians in Massachusetts as 5,494. Therefore, of the physicians of this State who offered their services to the Government in this time of need, 30.9 per cent. were accepted. If we deduct the 132 names of those who were offered commissions in the medical corps but were not called to service, 1,568 men actually served, or 28.7 per cent. of all in the State.

It is to be borne in mind that the entire personnel of physicians in the State includes the women, the disabled for active duty, the retired from practice, and those too old for military service. Of those in the printed list 19 died while in the service. The list does not include those physicians who labored on the draft boards, the specialists who acted as contract surgeons, the members of the state and city boards of health, the indispensable members of the faculties of the medical schools, nor those who, staying at home, looked after the practices and the families of their brothers who were at the front. The showing is most creditable to the patriotism of the medical profession of the Bay State.

## VENEREAL DISEASE CONTROL.

In order to secure the success of the campaign for the control of venereal diseases in the United States, the coöperation of medical, dental, and pharmaceutical schools, the hospitals, clinics, and the training schools for nurses is important and necessary. The Bureau of Public Health Service has announced in a circular letter that this may be accomplished by calling a convocation of faculty, staff, and student body, by giving exhibitions of educational photo drama films, by arranging meetings to be addressed by the president of the State Board of Health, the local, municipal or county health officer, the Public Health Service representative appointed to the State, and the United States Public Health Surgeons in charge of the clinics established in the State; and by complete permanent exhibits of official literature issued by the United States Public Health Service and State boards of health.

The work already accomplished in venereal disease control has been considerable. When the Chamberlain-Kahn Act created the Division of Venereal Diseases in the United States Public Health Service and the great work of venereal disease control was inaugurated, the plan of procedure formulated was grouped under three headings, as follows:—

1. Medical measures.
2. Law-enforcement measures.
3. Educational measures.

The educational measures include the dissemination of information by leaflets, lectures, ex-

hibits, moving pictures, stereopticon views, and other means, among industrial plants, commercial institutions, clubs, libraries, community centers, schools, churches, the home, and every walk of life.

The law-enforcement measures include encouragement of the closing of restricted districts; stimulating enforcement by State and municipal officials of laws and ordinances directed against prostitution in all its phases, the establishment and management of institutions for rehabilitation of venereally infected persons, and the commitment to institutions of venereally infected feeble-minded persons; urging the adoption and enforcement of laws and ordinances compelling the reporting of the venereal diseases, the prohibiting of quack advertising, and the sale of venereal disease nostrums; and other measures designed to prevent the spread of the venereal diseases.

The medical measures include the establishing of clinics; securing hospital facilities for venereally infected persons; making available laboratory facilities for the scientific diagnosis of venereal diseases; securing wide distribution of arsphenamine or similar products; obtaining the support of the entire medical profession by the reporting of their cases to the State Board of Health and the treating of venereally infected persons, in accordance with the best modern methods; securing the coöperation of druggists in refusing to dispense venereal nostrums and directing prospective purchasers of such remedies to venereal disease clinics, or reputable physicians; securing the coöperation of dentists and nurses in their respective fields of practice; and enlisting the interest and services of all medical, dental, and pharmaceutical schools, societies, and journals. Appeals have been made to newspapers and druggists, and the spirit of willingness to coöperate has been gratifying.

At the first of a series of educational and official film exhibitions for medical schools and members of the attending and nursing staffs of hospitals, held under the direction of the Division of Venereal Disease at Washington for the benefit of the faculties and student bodies of the Medical and Dental Departments of Georgetown University, the venereal disease problem in civil life was reviewed. Dean George M. Kober, after commenting upon the progress of

hygiene, is reported to have included the following remarks in his address:

Of 274,611 patients treated in the city hospitals of Washington there were no less than 27,947 cases of venereal diseases.

In 1909 the American Public Health Association, appreciating the gravity of the situation, appointed a committee to consider and report upon the best method of educating the public with respect to the communicability and prevention of gonorrhea and syphilis.

Our committee had no accurate statistical data as to the prevalence of these diseases in civil life apart from the statistics collected for the President's Homes Commission. We knew in a general way that fully 80 per cent. of all the operations for inflammatory diseases peculiar to women are of gonorrheal origin; that the same germ was responsible for blindness in 15,000 of the 50,000 blind persons in the United States; that Dr. Cole, in Osler's Modern Medicine, cited 19 epidemics of gonorrhea, with 660 cases among children in various hospitals; that Dr. Holt had observed 273 cases of gonorrhea in the babies' hospitals in New York, and that Neisser, the discoverer of the germ, estimates that more than 45 per cent. of all involuntary childless marriages are due to this cause.

We also know that syphilis was responsible for 42 per cent. of abortions and miscarriages, and that from 60 to 86 per cent. of the offspring of syphilitics die before, or shortly after birth, and those who survive are subject to physical and mental defects; that it was the cause of over 90 per cent. of the cases of locomotor ataxia, and a prolific cause of apoplexy, paralysis, softening of the brain, insanity, diseases of the heart, blood vessels, and other vital organs.

Dr. Kober reported the following statistics, which show the total admission rate of venereal diseases per thousand in our own and in foreign armies:

	YEAR	SYPHILIS	CHANCER	GONORRHEA	TOTAL
			ROD		VENEREAL
U. S. Army	1908	30.45	30.77	135.77	196.99
U. S. Navy	1909	26.49	28.23	105.11	159.8
Japanese Navy	1907	.....	.....	.....	139.8
British Navy	1908	37.46	17.87	67.16	122.5
British Army	1908	35.1	28.23	40.7	104.0
Spanish Army	1907	11.6	27.84	28.4	67.8
German Navy	1908	17.3	9.5	36.4	63.2
Russian Army	1907	17.7	12.2	30.2	60.1
Austrian Army	1907	16.0	10.1	28.1	54.2
Japanese Army	1907	10.1	10.4	17.1	37.6
Belgian Army	1907	6.2	.....	19.09	26.2
Dutch Army	1905	4.6	.....	17.0	21.6
Prussian Army	1907	4.4	2.1	12.2	18.7
Bavarian Army	1907	3.3	0.97	10.9	15.2

The present war revealed the fact that the total admission rate for venereal diseases per

thousand men in five National Army camps.—Dix, Lee, Upton, Meade, and Pike,—was 337.2. Of the 45,000 cases reported between March 29 and November 15, 1918, nearly 96 per cent. had contracted the disease before enlistment.

In explaining the Government's program, Assistant Surgeon-General C. C. Pierce commented upon the importance of the Chamberlain-Kahn Bill, and is reported to have made the following statements:

Prior to the passage of this Act the United States Public Health Service, realizing the urgent necessity for control measures for venereal diseases, had opened negotiations with the various State Boards of Health, with a view of having established in each state a bureau of venereal diseases, to have general supervision over all phases of this important work. The plan was to have an officer of the Public Health Service stationed in each of the various States, for the purpose of coöperating with the State Board of Health in establishing a fourfold work, as follows:

(a) Securing the reporting of venereal infections, in accordance with the State laws or State Board of Health regulations.

(b) Carrying on repressive measures, including the isolation and treatment in detention hospitals of infected persons who are unable or unwilling to take the necessary measures to prevent themselves from becoming a menace to others.

(c) Establishment of free clinics for the treatment of venereal diseases, and extending the facilities for early diagnosis and treatment by providing proper laboratories to make exact diagnoses and examinations to determine when patients might be released as noninfectious.

(d) To carry on a general educational campaign to inform the public, as well as the infected individuals, regarding the nature of these diseases and the manner in which they are spread.

It is gratifying to be able to say that 44 of the states are now carrying on this standard program for venereal-disease control. While many persons have heartily entered into this work on account of the patriotic appeal made to them that it was a necessary war measure, they should now realize that it is just as necessary in time of peace. The great problems of reconstruction cannot be handled by our people unless the entire citizenship of the country is maintained at the highest standard of efficiency. The prevalence of venereal infections throughout the whole fabric of civilization is so enormous that there are no other causes that produce such widespread misery, suffering, loss

of efficiency, and damage to posterity as the venereal diseases. Therefore, now that the world has been made safe for democracy, let us likewise make it safe for posterity.

#### WORLD-WIDE COÖRDINATION OF RED CROSS ACTIVITIES.

THE proposed world-wide coördination of Red Cross activities has been considered recently at the International Conference of Red Cross Societies. This conference was called at the request of the Red Cross societies of the United States, France, Great Britain, Italy, and Japan. The original Geneva convention was designed primarily to guarantee neutrality to those actually engaged in the care of sick and wounded combatants. The war has clearly shown, however, that modern warfare extends beyond the limits of the battlefield into the homes of the nations involved, to the refugees and civilians who have suffered at the hands of the combatants. The Red Cross, signifying as it does neutrality and sympathy between nations, races, religions, and classes, is peculiarly adapted to the relieving of the suffering of humanity, through the study of human disease, and by promoting measures for public health and sanitation, child welfare, training of nurses, and the care and prevention of tuberculosis, venereal diseases, malaria, and other chronic or infectious diseases.

At the conference at Cannes, the past experience of nations has been reviewed carefully, and it has been planned that the international organization at Geneva will continue to formulate and propose to individual Red Cross societies lines of Red Cross effort in the interest of humanity. The following statement by Henry P. Davidson outlines the purpose of this plan:

The conception involves not merely efforts to relieve human suffering but to prevent it; not alone the suffering of one people but an attempt to arouse all peoples to a sense of their responsibility for the welfare of their fellow-beings throughout the world.

In brief, the plan contemplates the formation of what will be, in effect, an association in the interest of all humanity.

It is a program, both ideal and practical; ideal in that its supreme aim is humanity; practical in that it seeks means and measures to meet the tragic crises which are daily recurrent in the lives of all mankind.

Surely the operation of such a plan would develop a new fraternity and sympathy among the peoples. By so doing, an important contribution will have been made toward the success of the League of Nations, and this present plan should be viewed as a vital factor in the larger undertaking.

The League of Nations aims to hold all peoples together in an effort to avoid war and to insure freedom: this particular plan aims at devising a procedure whereby all peoples may cooperate actively in promoting the health and happiness of one another.

### MEDICINE AND LETTERS.

MANY instances of a close bond between British letters and medicine have been reviewed in a recent issue of *The British Medical Journal*. Sir Thomas Browne, Tobias Smollett, Oliver Goldsmith, and John Keats are mentioned as notable examples of men who have achieved fame as writers and who yet can be claimed by the medical profession. Sir Thomas Browne practised medicine for many years, first in Oxfordshire and later at Norwich. It is interesting to know that Smollett's writings have been somewhat influenced by his service as surgeon's mate in H. M. S. *Cumberland*, and that he practised for a while after leaving the sea. It may not be generally known that Keats served four years as an apprentice at Edmonton, studied at the United Hospitals, became a Licentiate at the Society of Apothecaries in July, 1816, and practised surgery for a short time. Another British author to have received a medical degree is Goldsmith, who is said to have graduated in medicine either at Louvain or Padua, and later began an unsuccessful practice in Southwark.

At the present time, St. Bartholomew's Hospital may claim the poet laureate. The Regius Professor of Medicine at Oxford and Cambridge has contributed to English letters. Conan Doyle, de Vere Stacpoole, and Somerset Maugham left the medical profession to enter upon careers as fiction writers and playwrights. Dr. Andrew Balfour, now devoting himself to the study of the parasitic diseases of the tropics, previously earned a reputation as a historical novelist. Other physicians, among them, Dr. Ronald Macfie and Dr. Habberton Lulham, have published volumes of verse. These men

are by no means all who have been actively engaged in the practice of medicine and have also contributed worthy prose and verse to English literature.

### MEDICAL NOTES.

DEBARKATION HOSPITAL NUMBER 5.—The following information about Debarkation Hospital Number 5, New York City, has been issued by the American Red Cross, and describes the organization of one of the most efficient of Army hospitals: No less than fifteen separate departments are maintained in working order, and through its Social Service Department the Red Cross takes personal charge of each wounded soldier who arrives, and until he leaves, his comfort is assured by a Red Cross worker.

In the Department of Patients' Records, a careful record of each man is taken and hung up in the ward, as well as filed for reference. The Department of Casualty Investigation keeps a special card file of patients by regiments, so that persons seeking information about missing men can be put in touch with members of his unit. Inquiries are kept in a permanent file and followed up with each new group of patients received.

Through the Department of Fraternities and Organizations, arrangements are made for patients to attend meetings of their various organizations. They are also put in touch with representatives of their State and Regimental Organizations, a list of the headquarters of which is at hand.

The Business Department takes care of the following Banking Facilities through the Empire Trust Company: The cashing of money orders, the exchange of foreign money, emergency loans to patients, the compilation of regular reports to all departments of the A.R.C., the supervision of supplies and storeroom, the shipment of packages by express and parcel post, and the supervision of telegrams for patients.

Entertainments are given every evening in the big auditorium on the first floor. This work in its psychological effect is recognized as being as important on the mental plane as medical and surgical work are on the physical. To help ward off the first shock of morbidity and in-

tropection, which is inevitable to the man who has come out of the war's inferno, is of fundamental importance. Every effort is made to rehabilitate these men, both physically and mentally.

On each of the twelve floors, some of which are medical and others surgical, there is a Red Cross Executive and three ward workers. Each floor is provided by the Red Cross with a recreation room. In it is a piano, a victrola, a billiard table, a library, newspapers, and magazines galore.

The actual capacity is 4000. Incomings and evacuations are going on constantly. More than 1000 wounded men are received during each week and sometimes more than 500 arrive in a single day.

#### BOSTON AND MASSACHUSETTS.

**CHELSEA HEALTH REPORT.**—The annual report of the Board of Health of Chelsea for the year 1918 reviews the epidemic of influenza in that city. The first cases appeared in the early part of September and increased steadily until the situation became grave about the middle of September. Four physicians were obtained from the United States Public Health Service to assist in controlling the disease; a nursing force was organized, and one floor of the Frost Hospital was given over to the care of influenza cases. Toward the latter part of October, the epidemic subsided. Influenza was made a reportable disease on October 4; the reports after that date record 684 cases in October, 20 in November, and 327 in December. It is believed by the health authorities that there were from 9,000 to 10,000 cases in the city. The majority of cases were among persons between the ages of eighteen and thirty years. The total number of influenza and pneumonia deaths during the epidemic was 179.

During the year, the Chelsea Board of Health has assisted the Child Welfare League, which was organized in June, 1918, for the purpose of developing infant hygiene work.

There have been reported during 1918, 83 cases of diphtheria, 59 of scarlet fever, 506 of measles, 222 of lobar pneumonia, pulmonary tuberculosis 108, typhoid fever 15. It is interesting to observe that during the last third of the year, at the time of the influenza epidemic, the number of diseases reported was considerably less than for the corresponding months in

1917. There was a total number of 1070 deaths, giving a death rate of 21 for 1000 inhabitants.

**BROOKLINE'S INFANT MORTALITY RATE.**—A survey made by the New York Milk Committee has shown that Brookline, with its infant mortality rate only 35.4 per thousand babies born, merits the distinction of having the lowest infant mortality rate of all the towns in the United States. Brookline had the lowest rate from 1906 to 1910, when its record was beaten by that of La Crosse, Wisconsin. In 1916, the honor of holding first place again went to Brookline, to be given to Pasadena, California, the following year.

Among cities having a population of more than 100,000, Fall River, with a rating of 161.3, had the highest infant mortality rate for 1918. New Bedford, among cities of 50,000 to 100,000 population, and Chicopee, of cities of less than 50,000 population, lost more infants during the first year after birth than any other communities in the country. Among large cities, San Francisco holds first place, with a rate of 57.2 per 1000, while Reading, Pennsylvania, had the highest record with a rate of 202.9 infants lost per thousand born. The rate for Boston is 114.9, slightly over the average infant death rate for the country, which is 104. New York's baby death rate was 92 per 1000, a figure slightly higher than its record for the previous year.

There were 2,700,000 babies born in the United States during 1918, probably the largest number in the history of the country. This figure shows an increase over the previous year of 27,000. The general infant mortality rate, based on reports from cities comprising 26 per cent. of the population, increased from 97.5 per 1000 births to 104.1.

**MORTALITY RATES OF LAWRENCE.**—A report recently issued by the United States Department of Health shows that Lawrence has the lowest death rate among textile cities, and stands third in the list of cities of 100,000 or more population. Only three country towns in Massachusetts have lower rates than Lawrence, and this city leads all the municipalities of the Merrimack valley.

The death rate among the children of Lawrence has been greatly decreased under the administration of the child welfare department. During the first six months of 1918, there were

366 deaths of children under ten years of age, while only 199 have died during the same period this year. Of children under two years of age, 280 died during the first half of last year, while only 147 of that age died this year during the same time. The child welfare department's four nurses and two assistants have cared for more than 2600 babies during the year and made nearly 10,000 visits to the homes of the children. More than 1500 babies attended the free clinics, and more than 2500 are being cared for now. Nurses visit the homes of new born babies, and care also for children referred to them by doctors, hospitals, social agencies, and neighbors. There are three child-feeding and child-care clinics each week.

Children in the primary grades are examined by the nurses and the school physician, and follow-up work is carried on to see that recommendations are heeded. Housing conditions are investigated, and wherever it is possible, families living under conditions which menace the health of the children are assisted in finding more sanitary dwellings.

**RETURN OF MAJOR-GENERAL GORGAS.**—Major-General William C. Gorgas, director of the yellow fever work of the International Health Board, has recently returned from South America, where he went to try to determine the seed beds of yellow fever, in order to institute systematic measures to destroy the disease at its source.

#### NEW ENGLAND NOTES.

**AMERICAN MEMORIAL HOSPITAL AT RHEIMS.**—It has been announced by the New England Branch of the American Fund for French Wounded that seventy-eight beds have been endowed and that twenty-four more are needed to complete the desired number. Twenty-seven of the endowed beds are credited to the New England district. This branch has also received the amount required for the sterilizing equipment and for one quiet room, besides pledges for the operating room and four more quiet rooms. Of the six thousand dollars needed to endow a bed in memory of the men from New England who gave their lives in France three thousand eight hundred and twelve dollars and twenty-five cents is still lacking. Over five thousand eight hundred dollars is needed to fulfill the pledges of the New England

Branch for the kitchen fund, over four thousand for the roof garden fund, and ten thousand dollars for the laundry and the convalescent sunporch. Contributions for any part of the hospital, for the general fund, or for additional bed endowments, may be sent to Kidder, Peabody and Company.

Since June 1, the American Memorial Hospital has been operated by the American Fund for French Wounded and the Woman's Overseas Hospitals. The city of Rheims has loaned for the use of this temporary hospital the remains of the Hospice for Incurables of St. Marcoul, founded in 1645. Its record from June 2 to June 8 shows that one hundred and ten cases were received in the dental clinic, there were thirty-four out-practice calls, sixty-one clinic cases, seventeen admissions to the hospital, sixty-two families aided in various ways, and nearly eight hundred and fifty articles distributed from the vestiaire.

**WAR RELIEF FUNDS.**—The principal New England War Relief funds have reached the following amounts:

French Orphanage fund	\$506,965.73
Italian fund	298,293.42
Russian Refugee fund	90,097.55

#### Obituaries.

##### ABRAHAM JACOBI, M.D.

The death of Dr. Abraham Jacobi on July 10, at his home on Lake George, is deeply regretted by members of the profession. Dr. Jacobi was born at Hartum, Westphalia, Germany, in 1839, and began his medical studies at the age of seventeen. He attended the gymnasium at Minden, and the universities of Griefswald, Göttingen, and Bonn. He joined the revolution of 1848, and was for a time imprisoned. He came to America in 1853 and established a practice in the tenement district of New York City, specializing in the diseases of babies and children.

Dr. Jacobi had been honored by many American and foreign medical societies and universities. The University of Berlin offered him the professorship of pediatrics, which he declined. He held similar professorships in the New York Medical College and the College of Physicians and Surgeons from 1870 to 1902,

when he was made professor emeritus. He held also many hospital appointments. Degrees were conferred upon him by New York University, Harvard, Yale, Columbia, and Michigan universities. For sixty years Dr. Jacobi was a member of the New York Academy of Medicine, serving for a time as its president. For more than fifty years he served in an official position at the Mount Sinai Hospital in New York. At the age of eighty-two, he was elected president of the American Medical Association. Dr. Jacobi had contributed several volumes to medical literature.

### JOHN F. DOWSLEY, D.M.D.

DR. JOHN F. DOWSLEY died recently at Newton of heart disease, as he was on his way from his home to the railroad station at Newton Centre. Dr. Dowsley was born in St. John's, N.F., 56 years ago, and came to this country at the age of 14. He was a graduate of the Baltimore College of Dental Surgery, and had practised dentistry in Boston for the past 35 years. He had served as trustee of the Forsyth Dental Infirmary, as president of the Massachusetts State Dental Society, as chairman for 20 years of the State Board of Registration in Dentistry, and for 27 years as president of the Massachusetts Board of Dental Examiners. In 1914, Dr. Dowsley went to London as a delegate of the National Dental Association of America. It was due to the suggestion of Dr. Dowsley that the entire Forsyth Dental Infirmary was given over to the State for free dental work for the soldiers on the way to Mexico in 1916 and later in the World War.

Dr. Dowsley was a member of the Boston Art Club and of the Boston Athletic Association. He had lived in Newton Centre for about three months, where he moved from Roxbury. He had been married twice, and is survived by two daughters and one son.

The death of Dr. Dowsley is deeply regretted, and is counted a distinct loss to the dental profession, in which he had attained an eminent position.

### JOHN B. MORAN, M.D.

DR. JOHN B. MORAN died after a long illness on July 12, at his home in Allston, at the age of 80 years. He was born at St. John, N. B., on August 2, 1838. He entered the Harvard Medical School in 1861, but left to serve in the Civil War. After serving as sanitary surgeon in the Peninsular campaign in 1862, he returned to continue his studies and received his

medical degree in 1864. He then studied for two years in Vienna, Prague, Berlin, and Paris, and returned to Boston and engaged in mercantile life for five years.

Dr. Moran began practising in the South End of Boston and in Roxbury in 1871, which he continued until ten years ago. He was a charter member of the Boston Medical Library and the Boston Athletic Association, a member of the American Medical Association and the Boylston Medical Society, and a fellow in the Massachusetts Medical Society. In 1885 he was elected the first instructor of hygiene in the Boston schools, and he served for a period of nine years on the Boston School Committee. Dr. Moran served as president of the Catholic Union of Boston in the years 1882, 1883, and 1884, and as president of the Charitable Irish Society in 1886 and 1887. He is survived by his widow, one daughter, and three sons, one of whom is Dr. Charles L. Moran, Lieutenant-Commander, M. C., U. S. N., Retired.

### Miscellany.

#### RÉSUMÉ OF COMMUNICABLE DISEASES FOR JUNE, 1919.

##### GENERAL PREVALENCE.

For the month of June there were 5,716 cases of communicable diseases reported, as compared with 9,048 in 1918 and 10,301 in 1917. This is also a decrease of 1,760 cases from the previous month. The case rate per 100,000 population for June was 145.8 as compared with 230.3 for June, 1918.

Diphtheria just reached the endemic index for the month, while scarlet fever and whooping cough exceeded it. Measles and typhoid were gratifyingly low.

The prevalence for the first six months of 1919 (January to July) for the more common diseases was:

Measles .....	1,983
Gonorrhea .....	4,790
Tuberculosis, pulmonary .....	1,054
Scarlet Fever .....	3,856
Diphtheria .....	3,653
Pneumonia, lobar .....	3,308
Whooping Cough .....	2,517
Syphilis .....	2,160
Mumps .....	1,547
Tuberculosis, other forms .....	411
Typhoid Fever .....	302
Epidemic Cerebrospinal Meningitis .....	150

**Diphtheria.**—As has been said, diphtheria just reached the endemic index for the month, with 183 cases, though this is a decrease from last month (559 cases). During June of last year 473 cases were reported.

**Lobar Pneumonia.**—It is of considerable interest to note that, in spite of the prevalence of influenza, during the first few months of this year, the number of lobar pneumonia cases reported so far this year is 3,308 as compared with 4,235 for the same period last year. Probably the explanation is that the influenza-pneumonias were generally called bronchopneumonias, which was probably correct, and as such were not reportable.

**Tuberculosis.**—Thus far this year pulmonary tuberculosis has shown a slight decrease, as well as other forms of tuberculosis reported. It is a great pity that more use is not made of the clinical facilities throughout our State, organized exclusively for the diagnosis of tuberculosis.

**Scarlet Fever.**—Although the 492 cases reported exceed the endemic index for this month, it is over one-third less than last month, when 805 cases were reported. The incidence per 100,000 was 12.3 (June, 1919), 20.5 (May, 1919), and 7.4 (June, 1918).

**Whooping Cough.**—The other common disease to exceed its monthly endemic index was whooping cough, 467 cases being reported; but this was only a little more than half the reported cases for the same period last year. The incidence per 100,000 was 11.7 (June, 1919) and 21.1 (June, 1918).

**Measles.**—The decrease in reported cases from last year, which was noted in May, still continues. 891 cases being reported in June this year as compared with 3,663 for June last year, and 3,832 for June, 1917. The incidence per 100,000 was 22.3 (June, 1919), 93.4 (June, 1918), and 99.6 (June, 1917).

**Typhoid Fever.**—The number of reported cases of typhoid fever for June was most satisfyingly low, being only three more than were reported in May. The Lawrence situation, which gave trouble earlier in the year, seems to be well in hand now. The incidence per 100,000 was 1.1 (June, 1919), 1.7 (June, 1918), and 2.7 (June, 1917).

**Veneral Diseases.**—This month the reported cases of gonorrhea showed a slight increase, and syphilis a considerable decrease from last month, 842 new cases of gonorrhea and 206 cases of syphilis being reported. Still the incidence is probably of little significance as to the prevalence of the disease in the various communities but rather as to the prevalence of reporting for treatment.

#### OUTBREAKS.

There were no outbreaks of any considerable significance. Various localities exceeded the endemic indices, and in practically every case it was traced to mild cases that were not diagnosed, and therefore not quarantined, frequently because no physician was called.

#### RARE DISEASES.

**Anterior Poliomyelitis** was reported from Belmont, 1; Everett, 1; Melrose, 1; total, 3.

**Dog-bite requiring anti-rabic treatment** was reported from Brockton, 1; Dighton, 1; Fall River, 1; Lawrence, 1; Lowell, 3; Worcester, 1; total, 8.

**Dysentery** was reported from North Adams, 1.

**Epidemic Cerebrospinal Meningitis** was reported from Arlington, 1; Boston, 6; Cambridge, 1; Hudson, 1; Lawrence, 1; Leominster, 1; Lowell, 2; Malden, 2; Marblehead, 1; Norwell, 1; Provincetown, 2; Quincy, 2; Rockland, 2; Salem, 1; Weymouth, 1; total, 25.

**Malaria** was reported from Boston, 1; Dedham, 1; Franklin, 1; Haverhill, 1; Lowell, 1; Needham, 1; Northridge, 1; Woblesley, 1; total, 8.

**Pellagra** was reported from Danvers, 1; Somerville, 1; Worcester, 1; total, 3.

**Rabies** was reported from Fall River, 1.

**Septic Sore Throat** was reported from Boston, 1; Brookline, 1; Lowell, 1; Newburyport, 1; Somerville, 1; total, 5.

**Smallpox** was reported from Belmont, 1; Boston, 3; Framingham, 1; Gloucester, 2; Lowell, 1; Ludlow, 2; total, 11.

**Tetanus** was reported from Dedham, 1.

**Typhomim** was reported from Boston, 3; Lawrence, 1; Newton, 1; total, 5.

**Trichinosis** was reported from Boston, 1.

## Correspondence.

### MASSACHUSETTS STATE DEPARTMENT OF HEALTH EXAMINATION.

State Department of Health,  
Boston, July 18, 1919.

Mr. Editor:—

The Massachusetts State Department of Health recently announced an examination to be held to establish an eligible list for the positions of District Health Officer and Male Epidemiologist in the subdivision of venereal diseases. This examination, which was to have been held on July 14 and 15, has been postponed to a date to be announced later.

The subjects on which candidates will be examined are: preventive medicine, communicable diseases, hygiene, sanitation, vital statistics, bacteriology and pathology.

Graduates from recognized medical schools, between the ages of twenty-three and forty, will be eligible for examination. Candidates over thirty-five must have had at least two years' experience in public health work. Persons who have had five years' experience and are not over forty years of age, will be eligible even if they are not graduates from medical schools. Preference will be given to citizens of Massachusetts.

By direction of the Commissioner of Health.

Very truly yours

B. W. CAREY, Director,  
Division of Communicable Diseases.

#### RECENT DEATHS.

DR. JOHN F. LOWSLEY died recently while hurrying from his home in Newton to the railroad station. He was born in St. John's, N. F., fifty-six years ago. He was a graduate of Baltimore College of Dental Surgery and established his practice in Boston. He had been a trustee of the Forsyth Dental Infirmary, and president of the Massachusetts State Dental Society and the National Association of Dental Examiners.

DR. E. JEANETT, GOODING died recently at her home in Braintree. Dr. Gooding was born in Boston on April 15, 1831. She was educated at the Charlestown Seminary and the Boston University Medical School, receiving her medical degree in 1877. She began practicing in Boston and continued until five years ago. In 1907 she moved to Wollaston, where she made her home.

DR. EDWARD COWLES, M.D., a retired Fellow of the Massachusetts Medical Society, died at his home in Plymouth, July 25, 1919, aged 82 years.

DR. HENRI HALLOPEAU, physician to the Saint-Louis Hospital, died recently at the age of seventy-eight years. He was born in Paris in 1842, received his medical degree in 1871, and was appointed physician to the Hospital in 1877. He became agrégé in 1878, and was elected a member of the Académie de Médecine in 1893. In 1884 he published a treatise on general pathology, which was translated into Spanish, Greek, and Turkish, and he was the author of more than eight hundred publications, ranging over the whole field of dermatology. He retired from Saint-Louis Hospital in 1907 and became consulting physician to the Maison Départementale of Nanterre, where he continued to work until 1918.

PROFESSOR ALBERT DIDERLEIN, who was one of the hostages at Munich, was shot during the recent political disturbances. He was born in 1860, received his medical degree in 1881, and, after holding the chair of obstetrics and gynecology in the Universities of Groningen and Tübingen, went to Munich. He had published a number of works on puerperal fever and other gynecological subjects.



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## Original Articles.

### MENTAL HYGIENE IN THE SCHOOL.

By HORATIO M. POLLOCK, Ph.D., ALBANY, N. Y.,

*Statistician, New York State Hospital Commission.*

MENTAL hygiene may be defined as the science which deals with the preservation and promotion of the health of the mind. It outlines the principles and prescribes the rules which must be followed if the mind is to grow or develop in a vigorous and healthy manner.

Mental hygiene is closely related to physical hygiene, as the mind is closely related to the body. Until recently it was thought that physical hygiene comprised everything necessary to the health of the individual, but now we know that physical hygiene alone does not suffice. Many a man with a strong, healthy body has a weak or sickly mind, or perhaps more commonly, an inefficient mind. Nearly half of the insane people committed to state hospitals have no physical disease. On the other hand, it is possible for an individual to have a strong, productive mind and a weak or unhealthy body. Pope, Darwin, and Carlyle are familiar examples.

Although the mind can sometimes rise above bodily infirmities, a life in which body and mind are out of joint, even though the life of a genius, is a one-sided, distorted life. The ideal is

the healthy body governed by the healthy mind.

Physical hygiene has been greatly emphasized in recent years. Introduced in the public schools about thirty-five years ago in response to the demands of the opponents of the liquor traffic, it has gradually won its way to an honored place in the school curriculum. Although the subject has often been poorly taught, much good has resulted from its use as a class study. Children have learned something about the most wonderful thing in the living world—the human organism. They have learned how it is constructed, how it grows and what they *must* do and what they *must not do* in order to keep well. Too often the course stops short of anything like complete knowledge of the subject, but no one will deny that the effort has been worth while.

Now, today, comes mental hygiene and asks: Why am I left out? We answer, that at the time physical hygiene was introduced in the schools few people knew that mental hygiene existed at all. New knowledge has changed the situation but has not entirely overcome ignorance and prejudice relative to mental defects and diseases.

On account of their evident one-sidedness, our text books in hygiene must be rewritten and mental hygiene and physical hygiene must be taught together. Mental hygiene will not be an

extra subject but the completion of a subject already being taught.

Unfortunately the principles and rules of mental hygiene are not yet adequately formulated. Thus far, writers on the subject have been principally psychiatrists, *i. e.*, physicians specially versed in mental disorders. They have told us how to conduct ourselves so as to prevent certain forms of mental disease, such as alcoholic insanity and general paralysis, and have given suggestions concerning the prevention of two mysterious psychoses known as dementia praecox and manic-depressive insanity. But the mental hygiene that is to be taught in the school room is still to be written. The topics it must deal with, however, are obvious to anyone who has given the matter serious thought. We need not depart widely from the general plan used in teaching physical hygiene.

To begin with, we must teach the general anatomy and physiology of the nervous system and its relation to other parts of the body and to the mind. In this study the special senses must receive adequate attention.

As a basis of approach on the mental side, we must teach the general principles of psychology, paying special attention to the relation of the central nervous system to mental processes. When this preliminary work is well covered the pupil will be ready to learn what must be done to promote the health of the mind. The order in which the subject matter of mental hygiene may be best presented will be determined as experience in teaching the subject is gained. The ground to be covered will include the following:

#### MENTAL HABITS.

Under this head will be considered the habits of mind which make for efficiency or inefficiency, as the habit of attention, of day dreaming, of active thought, of listlessness, etc. It is easy to distinguish the habits that make for efficiency and health from those that make for inefficiency and disease. In this connection the best schools will not stop with merely pointing out the necessity of the formation of correct mental habits, but will use every means within their power to inculcate such habits in their pupils. To do this requires close observation of the reactions of each pupil to the various phases of school life. Does the pupil take a keen interest in all of his school work? Does he mingle freely and cordially with his fellow pupils? Is he interested

in school athletics or in school societies, musical organizations, etc.? Are adequate opportunities for self-expression given him and does he take advantage of such opportunities? Is his thought clear or confused? Does he meet perplexing situations squarely or evasively? Does he welcome work and responsibility or does he try to avoid them. Is he making fair progress and does he have a forward look? Answers to questions such as these will show the pupil's mental characteristics. If the answers are very unsatisfactory, it is evident that a further inquiry must be made. The child may be mentally or morally weak; he may be suffering from defective special senses; he may have some physical handicap; he may be the victim of a vicious environment; he may be troubled with mental conflicts; or his condition may be the result of his own unhealthy mental habits. Whatever may be the cause of the child's difficulty, it should be discovered and corrected if possible. \*

Many a child acquires faulty mental habits in the schoolroom. Instead of developing into an alert, active worker he becomes listless and indifferent, and he dawdles along in his work content to secure merely a passing mark and caring but little if he fails completely. The fault may be in the child or in the school, or the child may be wrongly placed. If a considerable portion of the pupils of any classroom are found to be indulging in faulty mental habits, the teacher and the school should be investigated. Some teachers are virtually carriers of mental disease; some schools are literally centers of contagion.

The school will not get far in helping the child whose mental habits are faulty without making a thorough study of the cause and getting at the root of the trouble. If it is found deep in the make-up or disposition of the child the most skillful treatment is necessary. If the defect is superficial, it may be remedied by making needed adjustments. To neglect entirely a mental disorder discovered in a child is as culpable as to refuse to give treatment to a child suffering with diphtheria or tuberculosis.

A thorough physical and mental examination of every child at the beginning of each school year would furnish data needed for effective hygienic work. Comparisons of such data from year to year would show the progress of the pupils and the efficiency of the schools.

## MENTAL FOOD.

That food is necessary for life and growth is as true of the mind as of the body. It is the business of the school to furnish food of the right kind for growing minds. The dietary of the school is the prescribed course of study while the daily ration schedule is usually left to the judgment of the teachers. In most schools all pupils of a class are fed in the same way and given the same quantity regardless of their capacity or the condition of their mental stomachs. If the mental food served does not agree with the pupil, it is assumed to be his own fault and he is usually given the option of taking the full course, or of leaving the school, or of dropping back and taking the year's work over. Mental indigestion is probably the most prevalent cause of failure in school. The remedy lies in preparing suitable food for each child. Is not the child more than the course of study, or mental health more than school regulations?

The school should not only furnish pupils mental food of the right kind, but show them what is best in the way of available mental nourishment, and how to get it and when to take it. What constitutes a balanced mental dietary for the active mind outside of school? What are the values of the various kinds of mental food offered, such as newspapers, magazine stories, fiction, history, science, art, music, etc.? When and how shall mental nourishment be taken? What is the influence on mental health and efficiency of the church? the theatre? the lyceum lecture? the motion picture? the dance? These and many other similar questions must be answered relative to the mental food available to the average child.

## EXERCISE.

The mind exercises by thinking. A school is a mental mess hall and gymnasium combined. Mental exercise of the right kind promotes mental health, but excessive mental exercise or severe mental strain may prove disastrous. As systematic exercise leads to the formation of fixed habits, it is highly important that the child be guided aright and that faulty tendencies be promptly corrected. Here, also, individual attention is demanded. By careful drill the weak places may be made strong and a well-rounded symmetrical mind may be built up.

## REST.

Mental rest comes through sleep, relaxation, and recreation. Sound sleep gives almost complete rest to the tired mind, relaxation affords less complete rest, while recreation or diversion gives relief to one set of mental activities by bringing another into play.

The concentration of attention secured in the best schools is very exhausting. In some schools, pupils are rushed from one class to another and no thought is given to mental fatigue or the need of relaxation. In such schools the last hour of the session finds teachers and pupils thoroughly exhausted, and they leave the schoolroom each day with a feeling of weariness, if not of disgust. The failure of schools to recognize the need of relaxation after each period of sustained concentration is a prolific cause of failure on the part of both teachers and pupils. Much attention has been given to the subject of fatigue in the schoolroom, and there is little excuse for ignoring the matter. The principles underlying the whole subject should be taught and applied by the school.

## ENVIRONMENT.

The environment of a child includes everything outside himself that he feels, sees, or hears. It is a constant influence during the child's waking hours and to a less extent during sleep. The child reacts continually to sensations coming to him from the environment. The sum of such reactions constitute a large part of the conduct or behavior of the child, and in course of time have marked effect upon his disposition and character. The environment also has great influence on mental health. Like begets like. A bright, cheerful environment begets happiness, while a dark, gloomy environment begets misery. Sometimes the environment may give rise to undue mental strain and cause severe mental distress. This was frequently the case during the recent war.

While the school can control but a limited part of a child's environment, care should be taken to make that part as favorable to mental health as possible. The child should be taught the effects of various environmental factors; proper safeguards should be put about him; and in some cases it may be necessary to remove him from vicious surroundings.

## PATHOLOGICAL CONDITIONS.

Pathological mental conditions belong to the

domain of the psychiatrist and physician but the elementary facts concerning such conditions should be matters of common knowledge. Every teacher should know something of mental defects, psychopathic states, neuroses and psychoses, and be able to read danger signs in the reactions of the children under her charge. The general causes of the various forms of mental defect and disease should be taught along with the causes of physical disease.

#### THE AIM IN TEACHING MENTAL HYGIENE.

The ultimate aim in introducing mental hygiene in the schools is to promote the mental health of each pupil. This cannot be accomplished all at once but it is the goal toward which effort should be directed. The social gains that would result from such an achievement are beyond computation. Pauperism, insanity, and crime would be greatly lessened, and the life of all would become more efficient and more harmonious.



#### TREATMENT OF PRURITUS ANI BY IONIC MEDICATION. PRELIMINARY REPORT.

By WILLIAM A. ROLFE, M.D., BOSTON,

*Assistant Rectal Surgeon, Boston Dispensary.*

[From the Rectal Clinic, Boston Dispensary.]

PRURITUS ANI is one of the commonest conditions seen by the rectal surgeon and one of the most rebellious to treatment.

Volumes have been written on its etiology and about every disease in the category has been mentioned as a direct or contributing cause.

The research work of Murray<sup>1</sup> is a valuable contribution to the etiology of this disease and his conclusion that the condition is one dependent on the infection of the perianal skin by the streptococcus fecalis, simplifies, to a great extent, the problem of treatment.

Until Murray's discovery of the cause of this disease, the treatment may be said to have been palliative. In a series of 181 cases examined bacteriologically by him, the streptococcus fecalis was found to be the common organism present in 168. In the remaining 13 cases, the infecting germ was not found because too few cultures were taken, and it is fair to assume that more extended examination might have resulted in a different finding.

In 113 of the 181 cases, Murray used an autogenous antistreptococcal vaccine which yielded good results in 99 of them.

Mummery<sup>2</sup> has described a local treatment for pruritus ani which employs electricity to drive an alcoholic solution of iodine into the tissues by cataphoresis. Since it is a fact that alcoholic solutions are not electrolytes, I fail to see how any benefit could be derived from such a procedure unless it be one due to the local action of the iodine on the superficial layers of the skin.

Other methods of treatment comprise the use of radium and exposure to the roentgen rays which are not altogether devoid of danger, as burns and sloughing of the skin have occurred, with no beneficial effect on the pruritus.

The surgical treatment of this condition involves a complete division of the sensory nerves of the affected parts; but in the light of our present day knowledge of the cause of this disease, recurrences are explainable.

Jones<sup>3</sup> defines ionic medication as a method of treatment in which electric currents are used for their power of setting the constituents of a solution in orderly motion in a definite direction. The current is able to convey the ions of an antiseptic chemical into the skin so that the ions are brought into direct contact with intracellular organisms lurking beneath the surface and out of reach of antiseptic lotions and ointments.

The substance introduced as ions by an electric current remain much longer in the tissues than when injected hypodermically. In the latter case, they occupy the interstices of the connective tissue and are quickly carried off in the lymph stream, whereas, when introduced electrically, they enter the actual cells of the tissues and are only slowly eliminated.

Ionization depends entirely on an electrolytic process involving the dissociation of the molecules of a metal or its salts, and must therefore not be confused with cataphoresis, which is based on the laws governing osmosis, electrolysis playing no part. It is well known that the ions liberated by an electrolytic action on many metallic salts, notably zinc, copper, and iodine, are of proven antiseptic value and can be made to serve a useful purpose in the treatment of infective conditions, when introduced by direct electric current of the proper voltage.

Leduc<sup>4</sup> states, "trusting to clinical evidence,

it can be said that antiseptic ions can be driven in to a sufficient depth to make them valuable in combating infective conditions."

In the treatment of pruritus and the perianal skin can be sterilized, and the application of the electrodes is not only painless but is entirely devoid of danger of producing burns or destruction of tissue.

No bacteriological examination of the skin was made in any of the cases in this series, but the beneficial results obtained would indicate that the infecting organisms were destroyed by the ionic applications, because it is very unlikely that the condition of the skin would improve without such action taking place. In a later and more complete report this phase of the subject will be considered.

The writer has been using ionic medication at the rectal clinic of the Boston Dispensary and also in private work for non-malignant ulceration of the rectum, anal fissures, cryptitis and pruritis, and it is on the latter condition that this preliminary report is based.

It is now about six months since this method of treatment was commenced, and while this is hardly a long enough period of time to enable one to draw definite conclusions as to the permanency of the results obtained, still it is sufficient to indicate that this method is a valuable one in the treatment of this distressing condition.

It has entirely supplanted the usual method of treating this disease by the use of anti-pruritic and cauterizing applications, stock vaccines, etc.

This series of pruritus cases numbers 30, in which are included 4 involving the scrotum. There were 2 cases of pruritus vulvae which are not to be counted as belonging to this group because they have only recently come under observation and have received but a few treatments. However, they both show satisfactory progress. It should be said that this series of pruritus cases is a selected one in the sense that none were subjected to this treatment which showed such complicating lesions as hemorrhoids, fissures, fistula, eczema marginatum, etc., which might be thought to have a possible contributing effect. The duration of the disease in these cases was from eight months to thirty-five years and all presented the characteristic skin changes in varying degree.

The results of this treatment have been very encouraging, not only from the fact that the

itching has been relieved after the first application but what is still more important, the condition of the skin immediately began to improve.

In six cases in which the skin was thickened, dry, and fissured, a return to normal appearance was noted after twelve or fifteen treatments given twice a week. As the condition of the skin improved, the itching diminished and in the six cases above cited, over three months have elapsed since the disappearance of the pruritus.

It was observed that after each treatment, there was a great diminution of the itching, amounting in some cases to a practical cessation, which lasted for about two days. Upon its recurrence it was less intense and more controllable, not requiring as much digging and tearing at the parts as before. In 12 cases the skin showed very marked improvement, coincident with a great lessening of pruritus, so much so that the patients reported an ability to sleep. The remaining cases are making satisfactory progress.

Murray found the opsonic index low for streptococcus in all cases of pruritus ani and states that in his experience no treatment which does not raise the phagocytic power of the blood against the infecting organism can have any lasting benefit. He further says that it is not known whether the infection occurs because the opsonins for streptococci are low or whether the opsonins are lowered because of the invading organisms.

The experience derived from the observation of this series of cases, in which improvement followed the destruction of the organisms *in situ*, would seem to point to the latter theory as the more probable one.

In particularly refractory cases, it would appear to be logical to combine the autogenous vaccine treatment with ionic medication, thus attacking the disease from within and from without.

During the treatment of these cases, no anti-pruritic ointment or washes of any kind were employed, but strict cleanliness of the parts was insisted on. Patients were instructed to wash the parts with hot water and soap after each defecation and always before retiring. This is a most important consideration in the treatment of this disease as it tends to prevent re-infection. In cases where the skin was moist and macerated, a simple talcum dusting powder was ordered.

The electrical apparatus\* used in the treatment of these cases was designed primarily for the use of the dental profession but the writer found it well adapted for use in the treatment of certain rectal diseases, by the substitution of suitable electrodes.

Briefly described, the apparatus consists of a portable motor transformer for use with direct current, the function of which is to cut down the ordinary lighting current voltage of 220-110 to 40, which has been found to be the proper voltage for use in ionization work. In connection with this is a small milliammeter with a reading of from 0-10 milliamperes which enables the operator to control accurately the amount of current that is being used.

Two electrodes are necessary, one a large plate of lead or brass about 18 cm. square covered with a layer of felt about 1 cm. thick. This is the negative or indifferent electrode.

The active electrode which is applied to the affected part in pruritus ani is made from a circular piece of sheet zinc or aluminum 6 cm. in diameter and bent in such manner as to fit into the fold between the nates. In the handle, which is attached to the centre of this plate, is a binding screw for the connection of the conducting cord. This electrode must also be covered with a layer of felt and is adapted for use with iodine or zinc solutions.

The success of ionic applications depends so much upon large currents acting for a long period of time that great care is needed to adapt the electrodes carefully to the surfaces under treatment in order to avoid irregular penetration. The larger the electrodes the more current can be employed with less discomfort to the patient.

The negative and positive terminals of this instrument are marked and the connecting cords are of different colors, so that it is an easy matter to identify them at a glance. This is an important feature for the reason that in using zinc solutions, for instance, it is necessary to apply the same with the positive pole, whereas, with the use of iodine, which is repelled or driven off from the negative pole, or in other words, electro-negative, the electrode must be connected with the negative pole.

#### METHOD OF USE.

The writer used two solutions in the treatment of pruritus ani; a 2% solution of zinc

chloride in distilled water and Lugol's solution of iodine.

The patient is placed in the right Sims position with legs well drawn up. The large felt covered electrode, wet with a 3% solution of sodium chloride, is slipped under the right buttock and connected with either the positive or negative wire, depending on whether a zinc or iodine solution is to be used.

It is important to place the active electrode in position before allowing the current to flow through the milliammeter, and also equally important to return the needle of the meter to 0 before removing the electrode for any purpose. By observing this precaution, the patient will not experience any unpleasant sensation.

Cases showing a moist, macerated condition of the skin are treated for the first two or three times by the application of the active electrode well saturated with 2% zinc solution and connected with the positive or red cord. This preliminary treatment has a stimulating effect on the skin, which becomes somewhat less moist and presents a more healthy appearance. After two or three applications, which should last from 15 to 20 minutes, Lugol's solution of iodine is used, diluted with 4 parts of distilled water. This is applied with the negative pole and continued in subsequent treatments in gradually increasing strength as the skin becomes more and more tolerant until such time as the undiluted solution can be employed.

As iodine ions penetrate deeper and at a faster rate than the zinc ions, the time of application can be reduced to about one-half that of the zinc solution. It is well to begin treatments with a mild current of perhaps 2 or 3 milliamperes, gradually increasing the amount until the patient begins to complain of a warm sensation. There is no need of causing pain and the amperage should be kept below the painful or so called irritation point.

Cases presenting a dry, thickened, parchment-like condition of the skin are treated from the beginning with diluted iodine solution, the strength of which is gradually increased in the manner already stated.

The applications should be given at least twice weekly and three times would be better unless the skin shows signs of irritation, which is to be avoided if possible, either by prolonging the interval between treatments or using the solutions in much more diluted form.

\* The Bitter Dental Mfg. Co., Rochester, N. Y.

The number of applications necessary varies with the chronicity of the case, the long standing one requiring more. It is well to continue the treatments for two or three weeks after the disappearance of the pruritus but once or twice a week will be sufficient.

As stated above, the length of time that this method of treating pruritus ani has been in use is not of sufficient duration to warrant the belief that a permanent cure has been found, but the writer is confident that this method is of great value.

In comparison with other treatments it has the advantage of being simple and easy of application, of doing away with the use of ointments, washes and cauterizing applications, and of perfect safety.

The writer has submitted this brief report hoping that others may become interested to pursue the investigation of the ionic method of treating this most distressing condition.

I wish to express my thanks to Dr. T. Chittenden Hill of Boston, for kindly referring to me all cases of pruritus ani in the Boston Dispensary, for treatment by this method.

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- <sup>2</sup> Mummery, P. Lochart, Diseases of the Rectum and Anus, p. 242.
- <sup>3</sup> Jones, H. Lewis, Ionic Medication.
- <sup>4</sup> Leche, Stephane, Electric Ions and Their Use in Medicine.

## SOUVENIRS OF A MEDICAL STUDENT'S LIFE IN PARIS A LONG WHILE AGO.

By BEVERLEY ROBINSON, M.D., NEW YORK.

IN reading Dr. Holmes' address reprinted in a recent issue of the *JOURNAL*, it brought to my mind many incidents of my life in Paris over fifty years ago. Velpeau, Andral, Cruveilhier, Dupuytren were by-words at that time of the past, but Ricord and Trousseau were still on deck. Trousseau's lectures at the Charity Hospital were models of grace of delivery and the art of medicine. His presence was refined, dignified and noble. He had his detractors, as he had his admirers. He was said by the former to be disingenuous. Grisolle in this respect was his antitype. Everything he said, or wrote, was relied upon as being absolute truth. He was not brilliant, but he was safe and sure. His work on Practice of Medi-

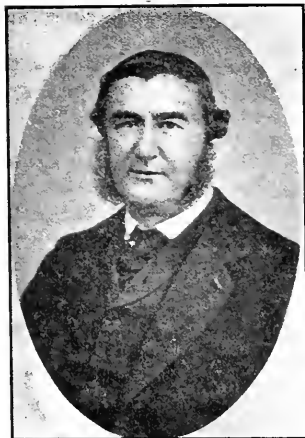
cine was the guiding hand of all students of medicine, much as Osler's is today with us.

My first year of medicine I served as *stagiaire* at the Pitié Hospital under the eye of Père Gosselin. Gosselin was a small rubicund man, passed middle age, absolutely reliable and honest, safe in every way. Not brilliant, but sure. As a surgeon he was what Grisolle was as physician. The only book of surgery used in those days by students was one of Follin—only completed after many years. One, as a rule, referred to special articles in the Dictionary of Medicine and Surgery for the best monographs on surgical subjects. Otherwise, reliance was essentially placed upon second rate surgical treatises whose names I fail now to recall. The two most renowned surgeons of those days in Paris were Nélaton at the Charity Hospital and Maisonneuve at the Hôtel Dieu. The former was refined, courteous, and admired by all. He was consulted by the highest and best from all parts of Europe. He used but two surgical dressings,—alcohol and spirit of camphor, diluted, or not. Maisonneuve was rough, at times almost brutal, but full of talent and originality. He never amputated cancer of the breast. He simply surrounded it with arrows of chloride of zinc paste and allowed the breast to slough off, with great incidental suffering to the patient; but opium was freely used in those days, hence the suffering was much mitigated; otherwise, it would have been unbearable. After amputations, he made a vacuum at the raw surface and covered it with many thicknesses of cotton wool. He claimed remarkable results. In those days there was no end to suppurative wounds. Some pus was called laudable; other pus of bad alloy. As to abdominal surgery there was none, or if there was, death was almost sure to follow. There were no prostatic operations and cystitis at times gave agony beyond thought, only in small degree relieved by opiates.

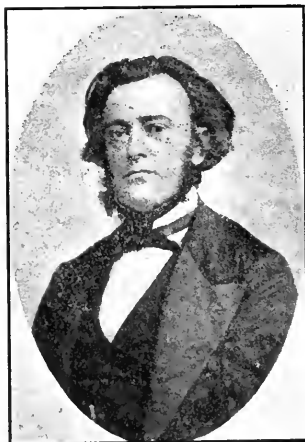
I served at the Hôtel Dieu, the old hospital, as externe of Behier, who had as chief of clinic the famous Bouchard. Bouchard had just come from the Salpêtrière where he served under Charcot. There he discovered that cerebral hemorrhage was caused, primarily, by aneurysms of arteries of the brain. Bouchard was an eminent scientist then and later; Behier was an admirable clinician. He was lively, whole-souled, beloved and followed by many devoted and admiring students. Bouchard was cold,



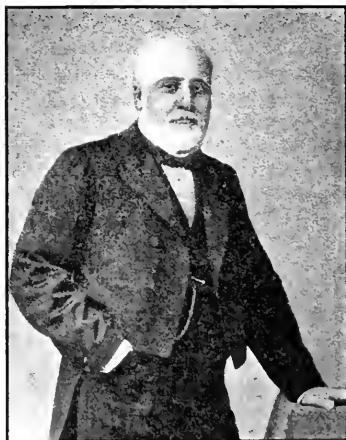
THÉO SASSEAU



RÉHIER



LE FORT



BERGERON

distant, and not easily approachable. We all had for him much respect and admiration, but not precisely affection.

While I was at the Hôtel Dieu the epidemic of cholera occurred in Paris and many deaths took place, and nowhere more than in the old hospital on the left bank of the Seine. The post-mortem room was a black hole underground—somewhat, I imagine, like the black hole of Calcutta. However, autopsies were made and students did them then, as they do now,—their duty,—and if afraid, they did not speak or show it. Hot tea and rum were the mainstays of in-

ternal treatment for choleries, and water with a little vinegar in it, as a protective remedy, highly commended by the good Catholic sisters of charity, who nursed all the afflicted with rare courage and devotion.

I dissected at the old École Pratique in Duplay's special amphitheatre, where there were perhaps half a dozen students. One was the late dean of the Paris Faculty, Dr. Debove, well known for his work on diseases of the stomach and his illuminating treatment of tuberculosis, as done formerly.

In those days, under the Empire, we had



émeutes in the streets and not infrequently the French medical students were implicated in these riots against the government. Comme citoyen de la libre Amérique I was well treated and drank many a bock while dissecting and listening to the harangues of a fellow student from the far West, U.S.A., who deplored the abject situation of the downtrodden French people.

Duplay, later, was professor of surgery at the Paris Medical School. After several years of hard work and much pleasure, I was named Intern of the hospitals. My other American colleague was the late Dr. Thomas Curtis of Boston.

At first I served as house physician at the Midi Hospital, where venereal diseases of men were treated. Dr. Curtis served at Lourcine Hospital, where women thus affected were solely treated. Dr. Curtis' attending physician was the late celebrated Alfred Fournier, a much beloved and admired pupil of Ricord. My attending surgeon, Dr. Simonnet, was most kind and intelligent, but not a prolific writer. He had his sayings, sometimes vulgar, as when he told me to support properly a swollen testicle, simply saying, "Monsieur, oeufs sur le plat, s'il vous plaît." Afterwards, I was house surgeon to Professor Léon LeFort, and later still, house physician to Bergeron at Sainte Eugénie Hospital, where I saw much malignant diphtheria. I did many tracheotomies while there and finally wrote my graduating thesis on "Heart Clot in Diphtheria." I made many post-mortems of the little patients who died under our care—and despite the unexampled devotion of our good sisters of charity.

Bergeron was a model of conscientious service to all. He never shirked any duty. When I visited Paris in 1897, I went to see him. "Now," he said, "Robinson, what can I do for you? Let's go and visit the diphtheria wards of Sainte Eugénie." I declined regretfully, because of my wife, who was with me in Paris and did not enjoy the idea.

We used freely powdered cubeb in those days in treatment of diphtheria, and Bergeron believed moderately in its utility. I had even greater faith, and my faith continues.<sup>1</sup> Bergeron was for many years Secretary of the Paris Academy of Medicine. He died, respected by everyone. He lived a life of good works—of love to God and his fellows on earth.

I might go on and repeat many things about the gay, attractive, if not absolutely sinless, life

of a French student of medicine in Paris. Murger was dead, but Vie de Bohème, Bal Bullier, le Jardin de la Pepinière, adjoining the Luxembourg, existed; and even the attractive, winsome grisette. Trilby was then really existent, and scenes such as Du Maurier portrays I have not seldom seen. Alas, for the days which have flown, and now we shall quaff a cup of kindness yet, for Auld Lang Syne.

#### APPENDUM

When in Paris over twenty years ago, I dined with Dieulafoy, at one time a fellow student, at that time professor of medicine. Duplay was present. Again, I dined with Debove, later dean of the faculty, and Charles Perier, distinguished surgeon, who coached me as pupil, candidate for the internat. I saw Bouchard, Rendu, Landouzy also, at one time dean, and other distinguished French physicians.

One day at the Medical Clinique of the Charity Hospital, surrounded by a crowd of enthusiastic students, Dieulafoy suddenly stopped his lecture on catching a glimpse of me in the outer circle. He said, "Voilà, Robinson, qui revient nous voir après bien des années. Montrez lui qu'il est le bien venu parmi nous." Grands applaudissements!

I have not spoken of the siege of Paris. I was not there, nor was I in an ambulance, I deeply regret to say. I wished vainly for the latter; as regards the former, circumstances which I could not control, obliged me to leave Paris just before the siege began.

Fortunately for my reputation, at home at least, I served as a private at the front in the emergency of 1863.

#### REFERENCE.

- <sup>1</sup> On the Catarrhal Type of Diphtheria and Its Treatment by Cubeb. By Beverly Robinson, M.D., *American Journal of the Medical Sciences*, July, 1875, p. 30.

### A NEUROLOGICAL SYNDROME.

CONSTANT OR FREQUENT IN PSYCHOPATHOSES\* WHICH IS NOT DESCRIBED IN THE LITERATURE.

By CLAES JULIUS ENERUSKE, M.D., BOSTON.

1. *The Syndrome.* In psychopathoses three physical symptoms,—increased cerebrospinal tension, increased maximum radialis arterial tension, and toxemia—are constantly (or fre-

\* The term "psychopathoses" is used in the same sense as in Southard's recent writings, *et.*

quently) found together with variable psychic anomalies. These three symptoms are to be referred to in this paper under the terms of dyshydrocephalotony, dysarteriotony,<sup>†</sup> and toxemia.<sup>‡</sup> Occurring always together in apparently similar manner, the symptom triad of dyshydrocephalotony, dysarteriotony, and toxemia constitutes a physical syndrome connected with constitutional psychopathic personality. (Even in praecox, dementia senilis, and paresis this syndrome is a constant or frequent complication.)

2. *Cerebral Hydrops.* The increased hydrocephalic pressure is caused by production of cerebrospinal fluid in excess of the amount which can simultaneously escape§ through the natural outlets from the cranial cavity (entry of the arachnoidal tufts in the dural sinuses, etc.) Thus cerebral hydrops is established, which persists continuously in persons of this class. An excessive amount of cerebrospinal fluid, particularly if continuous, is always a symptom of disease. A disease of which excessive cerebrospinal fluid is a symptom is always present as a complication closely connected with psychopathic personality. (Such a disease is also closely connected with the onset and development of praecox, dementia senilis, and paresis.)

3. *Measure of Hydrops.* The amount of hydrops existing in excess of the normal amount of cerebrospinal fluid may be roughly estimated by measuring the quantity, the withdrawal of which through lumbar puncture (under due precautions) is sufficient to reduce the cerebrospinal tension to the normal pressure level. This quantity is variable. In young boys with psychopathic tendencies, during quiet intervals, withdrawal of 8 cc. cerebrospinal fluid|| may be sufficient to reduce the tension to about the normal pressure level and thus temporarily to relieve the hydrops and for some hours to re-establish approximately normal hydrostatic tension in the cranial cavity. However, soon afterwards the fluid is again reproduced in excessive amount: in less than 24 hours after the lumbar puncture a measurable excess appears; and in less than 48 hours the cerebrospinal ten-

sion may exceed the tension at the time just preceding the withdrawal of the fluid.

4. *Exacerbations of Hydro Pressure.* The hydrocephalic hypertension varies in different psychopathic individuals and in the same person at different times. At the occasion of outbursts of temper and violence, and preceding such outbursts, the cerebrospinal tension increases in excess of the hypertension which continuously exists in persons of this class. The observation that cerebrospinal hypertension is continuous does not exclude the possibility of remissions associated with spontaneous reduction of cerebrospinal tension to normal pressure level. Such remissions may occur in certain psychopathic persons, but hitherto I have not seen spontaneously normal cerebrospinal tension in this class of individuals.

5. *Hydrops Produces Cerebral Anemia.* Increase of hydrocephalic pressure, when continuous, is in some degree an impediment to the normal flow of blood through the cerebral arteries, and this impediment is particularly emphasized when, simultaneously with the tantrums and preceding their outbursts in violence, the cerebrospinal pressure rises to a level above the continuously existing hypertension. Thus results cerebral anemia in some degree, varying at different times with the variable degree of hydrops and cerebrospinal hypertension, which cerebral anemia, in view of facts already mentioned, may be assumed to reach maximum at periods of tantrums and preceding the outbursts of distemper and violence. The assumption of cerebral anemia is based on clinical evidence; it is not physiological deduction.

6. *Cerebral Anemia and Psychopathic Anomalies.* Many of the symptoms of psychopathoses resemble symptoms known to exist together with cerebral anemia and supposed to be caused by it. I allude particularly to initial and lesser symptoms, such as headaches, insomnia or somnolence, impaired attention, inaptitude for work, psychic pain, psychic unrest, irritability.

7. *Increased Intracranial Pressure: Is it a Cause of Pressure-atrophy and Loss of Cerebral Neurons?* Cerebral anemia, caused by increased hydrocephalic pressure, if long continued, interferes with the osmotic processes and impairs the nutrition of the brain. Thus pressure-atrophy develops with the injury caused by toxic irritation: degenerative changes, deposit

<sup>†</sup> Regarding dysarteriotony, cf. Enebuske: "On the Vasomotor Unrest in the Insane," *Boston Medical and Surgical Journal*, March 15, 1917; *ibidem*, "The Normal Arterial Tension," *ibidem*, March 6, 1919.

‡ A paper on the subject of toxemia will be published by the author at a future date.

§ Cf. page 206.

|| Due precautions.

of products of disassimilation in and about the ganglions, shrinking and gradual disappearance of ganglions and axons together with reactive glioproliferation progressing slowly, and finally entailing symptoms of organic mental deterioration beyond the early psychopathic stigmata, even though this development may be slow in persons belonging in this class.

8. *Biochemie-hydrostatic Conception.* The preceding conception should not be understood as contradicting or in any particular disputing the psychological conception of psychopathic personality. On the contrary, it supplements the physiological and the anatomical conceptions. The demonstration of the coexistence of certain well-defined physical (biochemie-hydrostatic) phenomena which in no wise contradict but supplement and even, in a measure, explain psychological phenomena and anatomical facts, previously observed and recorded, should only strengthen and amplify the scientific value of such conceptions previously established.

9. *Intracranial Pressure and Psychopathic Tantrums.* In view of what has been represented on the preceding pages, we may now picture in our minds the state of the psychopathic person during the periods of tantrum with outbursts of distemper and violence. What particular form the outburst may take and what its content may be, whether it be swearing, banging, breaking and throwing things about, or taking the other man's life, running away with the wrong woman, stealing a neighbor's money, setting his house on fire, or numberless other incidents of this kind, they are all phenomena in different ways related to the operation of psychological processes, the discussion of which would not be worth the while in this connection. That which concerns us in this connection is the biochemie-hydrostatic intracranial situation: with cerebral hydrops due to toxemic irritation of the ependyma (ependymal cells lining the vascular choroid plexuses), caused by disturbances of the metabolism of as yet imperfectly understood nature but appearing to be connected with subnormal activity of certain enzymes: with the cerebrospinal pressure, already beforehand abnormally high, now rising still higher: with his corona radiata and internal capsule, his cortex and basal ganglia, his crura, pons, cerebellum and medulla seized, as it were, in the grip of the increasing hydrocephalic pressure.

His brain is as if pressed in a vise, the one jaw of which is in the lateral ventricle, his mid-cerebral, and his fourth, the other in the pia-arachnoid space. The distemper and violence, tantrums of whatever nature, break out from the dysthymic and dysbulic mental soil, made up of psychic pain and psychic unrest, anxiety and irritability, connected with the pressure-mechanism alluded to.

10. *Importance of Increased Intracranial Pressure.* The coincidence of the exacerbation of the hydrocephalic hypertension with the exaggeration of the psychological reactions is sufficient reason to consider this symptom very important from a nosological viewpoint.

b. The fact that the exacerbation of hydrocephalic hypertension precedes in time the outburst of distemper and violence and may precede them by hours, emphasizes still more the importance of the study of this symptom.

c. The fact that exacerbations of hydrocephalic hypertension, as here described in reference to psychopathoses, occur with apparently similar connections (although with different forms and contents of the outbursts) in raptus epilepticus, raptus melancholicus, and raptus maniacus, as far as my observations hitherto can determine, besides being observable in phases of excitement and agitation in praecox, dementia senilis, and paresis, strengthens my justification, if need be, in calling the attention of the profession to this symptom.

d. Finally the fact that increased cerebrospinal tension, as described, is capable of being eliminated by rational therapy, completely or in greater or smaller degree, in the diseases considered in this paper, endows this symptom with still further interest and importance from a practical point of view. This will now be briefly considered with reference to the etiology of psychopathoses, as well as diagnosis, prognosis, therapy, and prophylaxis.

11. *Etiology.* Considering the great prominence given in contemporary literature to heredity as a principal etiological factor in determining constitutional psychopathic inferiority, the symptom of dyshydrocephalotony should be given proper consideration in determining the etiology of an individual case. If the elimination of this symptom by therapeutic technique, of whatever kind it may be, is followed by more or less reduction of the psychic anomalies previously existing, the origin of the disease should not unhesitatingly

be charged to heredity. In fact, failing development of cerebral neurons caused by anomalous intraeranian pressure and toxic irritation, with mental defectiveness as sequel, may have taken place early in life after birth or even before birth as a result of the physical disease of which the cerebral hydrops is a symptom.

Indeed, the disease which causes the excessive production of cerebrospinal fluid may have originated before birth in consequence of diseased metabolism of the mother during pregnancy. Subnormality of enzyme-action of the mother during pregnancy may have caused cerebral hydrops of the child before birth. Failure of development of part of the encephalic neurons as well as appearance of "physical stigmata of degeneration" such as macrocephaly, craniofacial scoliosis, and a multitude of cranial and facial anomalies and defects may thus be understood as results of abnormal degree and distribution of hydrostatic pressure ante partum.

To the scientific mind such interpretation certainly seems more comprehensible and satisfactory than charging the genesis of constitutional psychopathic inferiority to the enterprise of a mystic "determina-substance carried by the germ-plasm."

12. *Diagnosis.* In reference to diagnosis, due attention should be given to the symptoms of dyshydrocephalotomy. Several of the symptoms belonging to psychopathoses are of such a nature that they may be satisfactorily understood as caused by increased intraeranian pressure and toxic irritation. If in a given case the elimination of the symptom of hydrocephalic hypertension, by whatever therapeutic technique, is followed by disappearance of the psychological symptoms presented by the case, and if thereafter the judgment, character, and conduct of the patient prove to possess fair normality, and if tantrums cease to appear in reasonably measured time, then reasons exist to admit the possibility of the symptoms in that particular case having been caused by anomalous intraeranian pressure due to chronic enzyme subnormality, pending further investigation, or some other removable cause not discussed in this paper. Such a case should not be labelled constitutional psychopathic inferiority.

13. *Prognosis.* In the mind of contemporary psychiatry, the prognosis of constitu-

tional psychopathic personality is pessimistic for obvious reasons. The prognostic notions of any period in medicine are determined by the sum of experiences of the past. On that ground the prognosis can only be pessimistic. However, throughout all ages of the past, the increased intraeranian pressure due to excessive production of cerebrospinal fluid has had its deleterious influence upon the judgment, character, and conduct of some individuals, and on some occasions it has had its disastrous share in the tantrums which from time to time have caused disturbances in the communities. If the time should ever come when the symptom of dyshydrocephalotomy receives the attention of general practitioners as well as neurologists and psychiatrists, it may yet be that the prognosis of constitutional psychopathic personality may get a share in the beneficent influence of the seeming optimism of American minds.

14. *Therapy.* Under the conception which I have discussed in this paper, it is obviously indicated to eliminate the increased intraeranian pressure. From the records of Quineke's idiopathic hydrocephalus, instances of spontaneous recovery from that disease are known. Therapeutic attempts in the past with reference to Quineke's idiopathic hydrocephalus as well as congenital hydrocephalus have been chiefly surgical. Operations of ingenious conception and brilliant technique (Harvey Cushing) have been performed; and in the literature, "Meningitis Serosa" is regarded as incurable by internal therapy. However, the etiology of Quineke's idiopathic hydrocephalus is unknown, and necropsic data leave this disease unexplained. Therefore, it would not be justifiable to conclude that the cerebral hydrops of psychopathoses is of the same nature as Quineke's "Meningitis Serosa," and consequently incurable by internal therapy.

In fact, the cerebrospinal hypertension in psychopathoses is reducible by internal therapeutic technique, if directed against the co-existing toxemia. If such therapy be carried on with exactitude and with the perseverance which may be required (in different cases varying from two weeks to fifteen months, according to the author's experience up to the present time), than a spontaneously stable cerebrospinal tension at approximately normal

pressure-level may be attained under felicitous circumstances.

In order to give a comprehensive view of the subject, it has been necessary in this paper to discuss the therapy as if toxemia were the only cause of the increased intracranial pressure in psychopathoses. It is one factor and important, but it is not the only one. For, supposing that the therapeutic technique applied has been carried through successfully, it is yet possible under certain circumstances that disturbances of cerebrospinal tension, derived from other entirely different causes than toxemia, may complicate the symptom-picture. The possibility of such complications must be foreseen by the physician and obviated, if possible; or else, if necessary, be met by suitable therapy according to the symptoms which are presented.

All these conditions cannot be discussed in the present paper without enlarging its scope far beyond the limits indicated by its title.

The results of any therapy that may be used under the conception here presented must be judged from two separate points of view: (1) Recovery from present symptoms, neurological and psychological, so far as they depend upon or are caused by increased intracranial pressure, cerebral anemia, and toxemia; (2) prevention of future mental deterioration by atrophy of encephalic neurons as the result of increased intracranial pressure and toxic irritation.

As a corollary to these requirements, it is important to study the influence which any therapeutic technique under consideration may have upon the production of cerebrospinal fluid and consequently upon the intracranial pressure.

15. *Prophylaxis.* The reader who has followed my discussion to this point is undoubtedly aware that I have in mind the class of youth whose education presents difficulties because of anomalies of judgment, character, and conduct, the class of youth which is apt to be sent on a circuitous route between home and medical consultant, police department, school authorities, insane hospital, charity and reform agencies, agricultural colonies, prisons, and other institutions of the kind in search for the most suitable environment for socializing influence and development.

The symptoms which at first attract the attention of guardians in these cases, and be-

cause of which medical consultation is resorted to, are apt to be headaches, insomnia, and minor psychic symptoms, such as impaired attention, inaptitude for work, psychic pain, psychic unrest and irritability. In such cases, headaches and insomnia are at first likely to be regarded as leading symptoms, and treatment may be instituted accordingly. Headache, when occurring in the symptom-picture alluded to, should not be disposed of without etiological diagnosis if this can possibly be made. The same may be said of insomnia, which, of course, is a very unnatural phenomenon in the young.

In the past, previous to the age of Reginald Fitz and William McBurney, bellyache was a symptom which not rarely was treated by anodynes, and the sequelae in the disease were not understood in their relation to lost opportunity. 'Who would now be willing to be present in a consultation where bellyache was left without etiological diagnosis and without adequate treatment?

Headache should always receive etiological diagnosis before therapy is resorted to. If headache in youth is associated with psychic pain and other minor psychic symptoms, with a tendency to chronicity, in such cases the possibility of increased intracranial pressure should be given due regard, even in the absence of such gross symptoms as choked disk, retracted neck, rigidity or palsies of muscles, innervated by cranial nerves, etc.

At any rate, whatever treatment may be resorted to, the influence of that treatment upon the production of cerebrospinal fluid and consequently upon the intracranial pressure is a matter that requires consideration.

Prophylaxis in youth may accomplish much. Even more may be expected from further development of the prophylaxis of pregnancy. Intracranial hypertension in the offspring, caused by prenatal excess in the production of cerebrospinal fluid, may be obviated in the future by improved understanding of the anomalies of metabolism during pregnancy. This problem is closely related to the further development of biochemic pathology under the influence of the scientific activities of the present time, in which American science, and particularly Boston science, occupies a conspicuous place.

Prophylaxis of pregnancy in relation to the intracranial pressure of the offspring evidently

may be considered to have an important bearing upon the future statistics of feeble-mindedness. The scope of this paper, as indicated by its title, precludes consideration of the vast subject of feeble-mindedness.

16. *Identity of the Disease of Which Increased Cerebrospinal Tension in Psychopathoses is a Symptom.* An excessive amount of cerebrospinal fluid, if continuously existing or frequently recurring, is a symptom of disease, and the disease of which it is a symptom belongs to the nosological group of hydrocephalus. Moreover, the cerebrospinal fluid in psychopathoses being normal in appearance without pleiocytosis or protein increase, the disease is related to idiopathic hydrocephalus internus, or "meningitis serosa," or ependymitis, or Quincke's disease. Quincke's disease involves a pathological increase of cerebrospinal fluid through over production or retention in the cranial cavity.

Retention, if it be the cause, may be due to obstruction at some point of the channels of outlet of the fluid from the cranial cavity, as occlusion of the foramina of Munro, Luschka, Magendie, or of aqueductus Sylvii, or of the perforations in the roof of the fourth ventricle or at the entrance of the arachnoid tufts in the dural sinuses, or through thrombosis of the dural sinuses, or through venous stasis.

Considering the fact that the cerebrospinal fluid in psychopathoses is of normal appearance, it is not probable that obstruction of the circulation of the cerebrospinal fluid is the cause of cerebral hydrops in psychopathoses. For the causes of obstruction, when such exist, are generally meningeal and ependymal inflammations, tumors, and sinus thrombosis, all of which give rise to symptoms which make them recognizable and which do not exist in psychopathoses, save as exceptional complications not belonging to psychopathoses as such.

It seems probable to a degree bordering on certainty that the excessive amount of fluid in the cranial cavity in psychopathoses is due to over production of the fluid. The deduction would be in accord with the rapidity with which the fluid is reproduced after withdrawal through lumbar puncture, as illustrated by the cases previously referred to in this paper (page 202).

The necropsic data of psychopathoses point to identity or similarity with Quincke's "men-

ingitis serosa," in which disease the ependyma may be smooth and natural looking in acute cases and thickened in chronic cases.

The clinical manifestations of Quincke's "Meningitis Serosa" have a wide range of variations. In acute forms the symptoms resemble infectious meningitis, abscess, or tumor with symptoms such as choked disk, retraction of neck, irritative or parietic symptoms from the cranial nerves, slow pulse, fever or not. In chronic forms the symptoms are headache, slight fever, exophthalmos, optic neuritis, spasm of the muscles of the head and the neck, paralysis of cranial nerves, somnolence and delirium, etc. Recovery may occur even in cases in which the symptoms may have seemed alarming. In chronic cases the symptoms may be so slight as to be scarcely noticeable.

In Quincke's disease, the morbid reactions connected with increased intracranial pressure are almost wholly neurological; psychological reactions are not prominent, and chronic cases are represented by such symptoms as somnolence and delirium. In psychopathoses, on the contrary, the morbid reactions connected with increased intracranial pressure from hydrops are overwhelmingly psychological; neurological reactions do not attract attention much in many cases.

Whether etiologically the hydrops of psychopathoses is identical with the hydrops of Quincke's "meningitis serosa" cannot be decided for the reason that the etiology of Quincke's "meningitis serosa" is unknown. In the etiology of the hydrops of psychopathoses, toxemia is a factor and an important factor, for reasons that have been alluded to on previous pages. In a subsequent paper, the subject of toxemia as the cause of increased cerebral tension will be discussed, and then I will present data obtained by direct observation and experimental methods which prove the reality of toxemia as a cause of increased cerebrospinal tension.

At present, for lack of knowledge regarding the etiology of Quincke's disease, the question cannot be decided; but the pathology and the clinical manifestations of Quincke's disease do not contradict the possibility that it may be identified with the hydrops existing in psychopathoses, and that the latter hydrops is a more chronic form of essentially the same disease as far as physical symptoms are concerned.

with possibly different pressure distribution, less basal, more ventricular (lateral), frontoparietal and cortical, at any rate with less marked neurological symptoms, and connected with the psychological symptoms of psychopathoses.

The foregoing discussion on the identity of the hydrops in psychopathoses may be summed up as follows:

The excessive cerebrospinal fluid in psychopathoses is either identical with Quinke's "meningitis serosa" or it is not. If they are not identical, then the hydrops of psychopathoses which I have described in this paper belongs to a new neurological disease which in connection with psychopathoses appears as the syndrome of dyshydrocephalotomy, dysarteriotomy, and toxemia.

If, on the contrary, further evolution of knowledge in this field should ultimately prove identity to exist between Quinke's disease and the cerebral hydrops of psychopathoses, then Quinke's disease should be curable by internal therapeutic technique for the same reason that the excessive production of cerebrospinal fluid in psychopathoses is curable.

If Quinke's disease in the future shall be proven to be curable by internal therapy, then we shall have evidence which may be expected ultimately to lead to therapeutic progress in the treatment of hydrocephalus of early infancy and, in consequence, lead to improvement in the statistics of feeble-mindedness.

Quinke's disease has never come under my personal observation, and my remarks in reference to it are based on recent writers. The description of this disease by Sir William Osler makes it appear to be a sort of sphinx, which may be the unexpected cause of disturbance and at times surprise the diagnostician.

17. *Conclusion.* The syndrome of dyshydrocephalotomy, dysarteriotomy, and toxemia needs the attention of general practitioners as well as neurologists and psychiatrists.

If the future destiny of the class of youth, which is spoken of as the class of constitutional psychopathic inferiority, is to be brighter than the past, the change for the better can come only through the activities and initiative of the medical profession.

Public feeling revolts against such conceptions as surgical sterilization and restrictive

marriage legislation. To sensitive souls segregation is synonymous with burial alive.

Ancient superstitions, demonological notions under new names, hypotheses without substance, *apparitio sine essentia* can be dissipated: coarse-fingered methods, cloaked cruelties of the past, and abusive powers over the defenceless can be abolished and substituted by rationalized methods based on true realities. It can be accomplished only through the growth and distribution of knowledge in the wake of the activities of medical science. Scientific research is endowed with eternal youth. Prophylaxis and therapy should never part from optimism. From antiquity descends upon us through the ages the unequivocal demand: "Let the cure and welfare of the patient be the first duty of the physician."

More than two thousand years ago, Hippocrates conducted the psychopaths and the insane out of the ancient temples of Asclepiades and intrusted them to the treatment and care of scientific medicine.

For about the last century these sufferers have been "humanitarianized." They are still awaiting the oncoming of the rational therapy and prophylaxis. While waiting, a portion of their encephalic neurons slowly or rapidly degenerate, shrink, and disappear with gliasubstitution and oedema under increased intracranial pressure. "*Fugit irreparabile tempus.*"

## Medical Progress.

### PROGRESS OF ORTHOPEDIC SURGERY.

BY C. HERMANN RICHOLZ, M.D., ROBERT SOUTHER, M.D., LT.-COL. ROBERT B. OSGOOD, II, C. LOW, M.D., MAJ. MURRAY S. DANFORTH, BOSTON.

(Continued from Vol. clxxx, page 675.)

#### BONE AND JOINT SURGERY.

##### Arthroplasty.

Baer<sup>1</sup> has had the chance to reopen four of the joints where arthroplasty with animal membrane had been done. In each case he found that the joint space persisted and the lining of the bones was perfectly smooth. The microscopic examination showed that the membrane is transformed into a fibrous tissue which covers

the bone and that a joint-like space is formed with fibrous walls, similar in all respects to the walls of a cavity encysting a foreign body.

The advantages of the membrane are: (1) the joint will retain as near its normal size and shape as possible; (2) the simplicity of the operation; (3) the stability of the joint; (4) less chance of infection because of the lessened handling; (5) less painful after-treatment, because movements are not begun before three weeks; (6) a normal joint is the ultimate result; no foreign substance is left as the membrane is absorbed within 60 to 100 days.

The membrane must be (1) thin and flexible; (2) tenacious to withstand disintegration for 60 to 100 days; (3) durable; (4) absolutely sterile. The membrane is made in the following way: The pigs' bladders, carefully selected, are thoroughly cleansed and disinfected and the submucosa obtained. They are then soaked for twenty-four hours in a medium hard potassium chromate solution, after which they are cut into the proper size, stretched on boards and exposed to the sunlight for three days, until the color corresponds to the reduction of the chromic salt. After being freed from all their soluble chromic salts they are thoroughly dried, and are then inserted into sterile glass tubes containing chloroform. At the time of the operation, these tubes are boiled for five minutes. The tube is then broken and the membrane placed in normal salt solution for ten minutes before using.

Baer reports 100 cases with 68 good results, painless and useful joints with more than 25 degrees of motion, as far as the hip and knee are concerned. For the knee he uses now the horseshoe incision through the patellar tendon, because the time of absolute rest, which is four weeks for the knee joint, allows a perfect union of the split tendon. In several cases of old tuberculosis the disease has lightened up again and spoiled the result.

Henderson<sup>25</sup> has collected 43 cases of arthroplasty from the Mayo clinic and 395 from the literature and from letters written to a number of surgeons. The results are given in the following tables:

COLLECTED CASES.

	No.	Good	%	Fair	%	Poor	%
Elbow . .	126	97	76	21	18	8	6
Knee . .	117	18	15	30	25	69	59
Hip . . .	98	56	57	18	18	24	24
Jaw . . .	32	30	93	1	3	1	3
Ankle . .	22	3	13	13	59	6	27
Total . .	395	201	51	82	21	108	27

CASES IN THE MAYO CLINIC.

	No.	Good	%	Fair	%	Poor	%
Elbow . .	21	12	55	3	13	6	27
Jaw . . .	12	8	66	2	16	2	16
Hip . . .	4	1	25	2	50	1	25
Knee . . .	4	..	..	1	25	3	75
Ankle . .	2	1	50	1	50	..	..
Total . .	43	22	55	9	21	12	27

Allison and Brooks<sup>36</sup> have made a careful and comprehensive study of the history of arthroplasty and have contributed to our knowledge by valuable experiments. They agree with Baer in considering animal membrane the most promising material of interposition, but emphasize that the substance used must have the least possible irritating properties. They have prepared a silver impregnated fascia in the following way: Living fascia is immersed in a solution of silver nitrate until it is hardened, and then the silver nitrate absorbed by the fascia is reduced to metallic silver. This gives a sterile, pliable, thin, non-irritating membrane. The reasons for the addition of the silver are: (1) it has been shown that metallic silver has definite inhibitory powers both of organisms and tissues; (2) the method of fixation is such that the membrane is always perfectly sterile; (3) the fixative, which is of necessity an irritating chemical, is entirely destroyed. The fascia may be taken from the patient by a preliminary operation. In doing arthroplasty on the knee joint the authors have previously used the horseshoe incision with temporary resection of the tibial tubercle; but recently they have given up this method of approach in favor of the anterior longitudinal incision, because they emphasize the necessity of early action and passive motion, which would not be safe before the time the tibial tubercle is perfectly united.

Putti<sup>37</sup> in the first article of his newly founded journal, "Chirurgia degli organi di movimento," describes his technic of arthroplasty of the knee joint which in essential points is similar to Payr's method: horseshoe incision with temporary resection of the tibial tubercle which is at the end fastened by a long thumb-nail, large flaps of fat and fascia over the ends of the femur and tibia, or over the femur alone, shaping the patella, lengthening, if necessary, the quadriceps tendon. The initial mobilization must be done by the patient himself with a simple cord and pulley device. Putti has obtained excellent results in 8 out of 10 cases showing mobility of 40, 50, 80, 85, 95, 100 and even 125 degrees.



### *Bone Grafts.*

Keith<sup>38</sup> discusses the history of bone grafting and sums up the subject as follows:

In the light of our present knowledge, among the conditions which determine the successful grafting of bones or of bone-fragments, we must place first asepsis. Grafts answer best which are taken from the patient's own body: the closer the genetic relationship of the graft-host, the better is the graft likely to answer. The graft-host should be young, and those grafts do best which contain all three elements of bone—bone, periosteum, and medullary tissue. The graft-bed must be free from blood-clot. Washing in normal saline solution damages the vitality of a graft. A graft must be placed so that the contact is effected with adjacent fragments; the contact must be firm and so designed that the graft becomes early subjected to the mechanical stresses and strains of the part.

Numerous experiments as well as a sufficient amount of clinical experience have convinced Gallie<sup>39</sup> that boiled bone is an excellent substitute for the autogenous graft. The great advantage lies in the chance to model the graft beforehand and save time during the operation. In this way plates and screws have been made for fractures,—long screws for fractures of the neck of the femur grafts, especially modelled for spinal operations, etc. Gallie points out the difference which exists between bone grafting in fractures and in Pott's disease in so far as in the former the contact is uninterrupted and in the latter not. But by examining operated cases seven months and two years after the first operation, he has found that even those parts of the graft which have not been in contact with bone become organized and at the end represent living bone. The observation that cancellous bone will be vascularized and permeated by living osteoblasts much more quickly than the dense bone of the cortex holds true also for boiled bone. Hence for plastic operations the material should be as porous as the required strength will allow. Beef ribs are excellent for spinal grafts.

Having found great difficulties in bridging defects in one bone of the forearm by Lane plates or intramedullary grafts, Baneroff<sup>40</sup> has used small bone fragments after experimenting on dogs in the following way: A piece of three cm. length is removed from the radius and the periosteum excised over the defect as well as one to two cm. over both ends. The excised bone is split lengthwise and all the endosteum removed.

Then it is cut in small fragments of one to two millimeter width and these are inserted into the defect. Good union was thus obtained in 22 cases. Baneroff thinks that too much importance has been placed upon the origin of the bone cell as the vital factor in bone repair. Bone is mesoblastic in origin; in its repair calcium salts are deposited on the intracellular elements of connective tissue, forming new bone. The connective tissue cell by metaplasia becomes a bone cell. Periosteum is connective tissue, hence prone to form bone, but it is not the only connective tissue that has this function.

### *Tendon Transplantation.*

Steindler<sup>41</sup> emphasizes the great possibilities of operative construction of the crippled and paralyzed hand with its muscle supply being much more abundant than that of the foot, with the greater chances of detaching muscles, the absence of gravity and weight bearing, and much greater possibilities of reëducation. Examples: (1) Drop wrist following paralysis of the musculo-spiral nerve; arthrodesis in slight dorsiflexion with transplantation of the flexor carpi ulnaris to the extensor digitorum. (2) Hyperextension of the metacarpo-phalangeal joints; osteotomy of the metacarpal bones similar to the osteotomy of the metatarsals described by Meisenbach for the treatment of claw foot. (3) Loss of opposition of the thumb; the tendon of the flexor pollicis longus is split within the thenar and its outer halves are fastened to the radial side of the base of the first phalanx of the thumb. (4) Inability to extend the thumb; transplantation of the extensor indicis proprius into the tendon of the extensor pollicis longus. (5) Loss of thumb; plastic repair by a piece of a rib and soft tissue skin flap. The after-care in all such cases, which should be started as early as possible, consists of medico-mechanical treatment followed by occupational work, such as moulding clay, raffia work, weaving, blocks, puzzle pictures, etc.

### *Operative Shortening of Bones.*

Calvé and Galland<sup>42</sup> discuss the objections against and advantages of compensatory shortening of the unaffected femur in cases of marked shortening of the other leg. The following objections have been raised against this method: (1) The muscles are too long; this is not so, but they adapt themselves very readily, as could be seen even during the operation. (2) The other objection that the body is shortened is

admitted, but the advantage of equalization is so great as to outweigh the disadvantage of the general shortening. The advantages on the other hand are evident: in certain cases a *restitutio ad integrum* is possible and at any rate the clumsy and expensive high-heeled shoe can be abolished. This method is much better than lengthening the affected femur, because the latter operation is very dangerous especially in old septic cases, such as war fractures; moreover, it is very difficult and often quite impossible to overcome the retraction of the muscles, even with multiple tenotomies. The operation is indicated with a shortening of five cm., and even up to a difference of thirteen cm. a full functional compensation can be obtained by removing seven cm. and allowing three cm. each for the flexed knee and a high sole.

The resection must be mathematically exact and no foreign material should be inserted. The authors describe three variations of their method.

1. Auto-pegging; a quadrangular tenon left on the lower fragment is inserted into the medullary cavity of the upper part.
2. Setting by tenon and mortise.
3. Dovetailing.

For numbers 1 and 2, the cutting surface is oblique; in number 3, it is horizontal. In addition to Albee's motor saw outfit a special set of instruments is used. A guide fastened to a bone forceps warrants exact cutting. For details, the original article with its excellent illustrations should be studied.

#### *New Approach to the Hip Joint.*

Smith-Peterson<sup>13</sup> describes a new supra-articular subperiosteal approach to the hip joint as follows: An anterior incision is made from the anterior superior spine along the anterior border of the tensor fasciae latae to below the level of the trochanter. Then a curved incision is made from the anterior superior spine along the crest of the ilium, through the origin of the gluteus medius about one-half inch below the superior border of its periosteal attachment. When the skin muscle flap is freed from the ilium by subperiosteal dissection and the origin of the tensor fascia is reflected together with the flap the capsule is exposed and is entered above the iliofemoral ligament.

The operation has so far been used in cases of congenital dislocation, for which it gives an

excellent approach: but the author believes that also for other procedures, such as arthrodesis, his method is likewise of advantage.

#### *Congenital Elevation of the Scapula.*

Peckham<sup>14</sup> has devised a new method for the relief of congenital elevation of the scapula. From a vertical incision between the scapula and the spinous processes, a wedge shaped piece of the trapezius is excised with the base at the spine of the scapula. The lower angle of the scapula is drawn toward the spine and fastened with chromic catgut to the region of the tenth, eleventh, and twelfth spinous processes. The result in the reported case has been very satisfactory; the shoulders are almost level and almost full elevation of the arm is possible.

#### *Simplified Laminectomy.*

Gaenslen<sup>15</sup> describes a simplified technic of laminectomy, as follows: The spinous processes are split as in Albee's operation, then broken down on the base, and the soft tissues and periosteum stripped off the laminae with the halves of the spinous process still attached. The operation proceeds further in the usual way. The advantages of this modification are said to be rapidity, diminished trauma and hemorrhage, more accurate and firmer closure by virtue of the union of the bony components. If advisable, a bone graft may be inserted, with the advantage that it finds numerous bone surfaces and not only on both ends as in the typical method of laminectomy. In the discussion, Ryerson advocates the method and says that by using the motor saw for splitting the spinous processes the trauma and hemorrhage may still be further diminished.

#### *Fractures.*

Brooke's<sup>16</sup> experience shows that a considerable damage may be done to the tibia by the removal of a piece of bone for a plastic operation. He has seen a fracture of the tibia in three cases where a grafting had been done for fractures of the upper extremity. The patients were allowed to walk after five weeks and the fracture of the tibia occurred from a very slight injury. In all three cases, the removal of the graft had been done with a motor saw and without chiseling. Hence it would seem well in such cases to protect the tibia for a longer time, when weight bearing is allowed so soon after the operation.

Treatment of the fractured femoral neck has been the subject of frequent consideration and

most observers recommend Whitman's abduction treatment as the method of choice at least for the early cases, both in adults and children, while they want to have the operative method reserved for certain selected fresh cases and for the old ununited cases. (Hunkins,<sup>47</sup> Taylor,<sup>48</sup> Whitbeck,<sup>49</sup> Ryerson,<sup>50</sup> Lord<sup>51</sup>). The most remarkable contributions along this line are those of Albee<sup>52</sup> and Brackett.<sup>53</sup> Albee has perfected the bone grafting method which he calls the glass stopper method. His technique is as follows: The fragments are properly adjusted from an anterior incision. Then from a lateral incision a canal is drilled through the subtrochanteric region, the neck and the head. In this canal is inserted a peg made of the tibia which fits exactly in the hole, like a glass stopper in the bottle.

Brackett has obtained very encouraging results in old ununited fractures by grafting the femoral head upon the trochanteric region in the following manner. From a large flap incision the trochanter is exposed. The insertions of the gluteus medius and minimus are lifted up with a thin slice of bone and the joint is opened. Then the trochanteric region of the femur is shaped to fit into a round depression which is made in the head. In abducting the femur one can now see the head move upon and with the shaft, usually to a surprisingly great extent. The leg is held in full abduction until the plaster cast is applied. No other fixation of the fragment is attempted than by exact suture of the capsule and the position of the leg in abduction. The glutei are fixed in place and the soft tissues sewed in layers.

#### *Fat Embolism.*

Caldwell and Huber<sup>54</sup> report on an experimental study of production and prevention of fat embolism due to trauma to bones. They found that crushing the tibias of mature rabbits produced a moderate and fairly constant amount of fat embolism, as determined by counting the fat droplets in a large number of representative microscopic fields, in stained sections of lung tissue. Esmarch constrictors placed on the legs of rabbits, previous to the crushing of the tibias and removed after two hours, lessen distinctly the amount of fat entering the lungs during the remainder of the experimental period; this effect is much less marked and more uncertain when they are removed at the end of a half hour or even one hour. The amount of

fat embolism which develops after the removal of the constrictors is dependent largely on the activity of the animals. Rabbits kept in chloral hydrate narcosis during the entire experimental period, following the crushing of the tibias, develop only a small amount of fat embolism although the constrictors are not used. The removal, by means of a motor saw, of grafts from the tibia of normal dogs and rabbits produces an appreciable but very small amount of pulmonary fat embolism. The use of the chisel for the removal of the tibial grafts from dogs increases very slightly, if at all, the amount of fat entering the circulation. The spinal part of the Albee bone transplantation operation, on normal rabbits, produces more fat embolism than does the tibial part.

(To be continued.)

### American Medical Biographies.

DWIGHT, THOMAS (1843-1911).\*

Professor Dwight, at the time of his death, had completed a career of nearly forty years as an investigator and teacher of anatomy, and during the last twenty-eight years had held the Parkman professorship, having succeeded Professor Oliver Wendell Holmes in 1883. For the last two years he suffered from an incurable disease, but, far from being discouraged, kept continuously at his work in his department and gave practically all his regular lectures. His courage and cheerfulness never failed him during this distressing period and he was able to show in a way most satisfactory to himself and his colleagues what a man can accomplish in spite of physical suffering and an impending sentence of death. His abilities as a lecturer appeared to the best possible advantage during the term of 1910-11, in the last course he was to give; and at the same time he was able to add several valuable contributions to his work on osteology, that part of anatomical science which chiefly appealed to him, and in which he showed his best work as a scientist.

Thomas Dwight, son of Thomas and Mary Collins (Warren) Dwight, was born in Boston, October 15, 1845. As a very young boy he was

\*From the forthcoming "American Medical Biography," by Dr. Howard A. Kelly and Dr. Walter L. Burrage. Any important additions or corrections will be welcomed by the authors.

taken abroad by his parents, making his first voyage in a sailing ship, and spent some years in Paris, where he attended school. On his return home he completed his education in Boston and entered Harvard College, with the class of 1866. After completing two years of his college course, he entered the Harvard Medical School, and obtained his degree of doctor of medicine in 1867, and an A.B., as of 1866, in 1872. After leaving the medical school he spent several years of study in Europe. He intended to engage in the active practice of his profession and attended the medical and surgical clinics of Berlin and Vienna, and also spent some time in England. His chief interest, however, was anatomical science and natural history, and part of his time abroad was spent in that study under Rüdinger at Munich. There he obtained his first knowledge and experience of the use of frozen sections in anatomical work, and was one of the first to introduce this method into America. In 1869 he returned to America and began practice in Boston and also in Nahant, his summer home. He continued in active practice for a number of years, but retired eventually in order to devote himself entirely to anatomy. During his active career as a practitioner he was surgeon to out-patients at the Boston City Hospital from 1877 to 1880, and visiting surgeon at the Carney Hospital from 1876 to 1883. In 1883 he was appointed a member of the board of consultation of the Carney Hospital and acted as president of the staff until his resignation in 1898.

In 1872 he was made instructor in comparative anatomy at Harvard, and, in 1874, instructor in histology, and gave, also, some instruction in embryology. At this time he was offered the position of lecturer in anatomy at the Medical School of Maine, at Bowdoin, and taught there until 1876, being professor of anatomy from 1873 to 1876, and in 1883 he was appointed Parkman Professor of Anatomy at Harvard.

Dr. Dwight was an excellent teacher and a strong, clear, and forcible lecturer. Under him the course to the first-year students was strengthened and expanded and a thorough course on regional and topographical anatomy for second-year men was gradually built up. He took especial interest in this advanced course and made it one of great practical value, but owing to changes in the curriculum it had to be given up in 1903. In the last few years he had developed a short course on x-ray anatomy,

which was intended to give the students some idea of the use of the x-ray and of the anatomical interpretations of x-ray plates.

Dr. Dwight's chief interest and his best anatomical work was in the anatomy of the skeleton and the joints, and on the normal variations in the body. His study of variations was applied chiefly to the spine and the hands and feet. For years he was engaged in making a very valuable collection of human spines, showing practically all possible numerical variations of the ribs and of the vertebrae in different regions and of fusions between different parts. The results of these researches appeared in a memoir of the Boston Society of Natural History and in contributions to other anatomical journals. He also studied and described the abnormalities at the top of the spine which might cause malpositions of the head and face. After completing his studies on variations of the spine he devoted himself to the same subject in the hand and foot, and succeeded in obtaining a remarkable series of specimens showing the chief variations in the carpus and tarsus and including several unique cases of variations in these regions. He was the first to find and describe the subcapitulum as a separate and distinct element in both hands. This was especially satisfactory to him, as Pfizner had described the possibility of the separate existence of this element, but had never seen a case of it. In the foot he found two cases of an absolutely new element, the intertarsal bone, which had never before been observed, and also two instances of the secondary cuboid bone. The first of these occurred in one foot and only one previous case had been seen by Schwalbe. The other occurred in both feet and was a unique case. In 1907 Dr. Dwight published an atlas on the variations of the bones of the hand and foot, based on the specimens in his collection and on x-rays. He was accustomed of late years to have x-rays made of all the hands and feet in the dissecting rooms, and accumulated in this way a valuable collection of plates, showing their normal structure and variations. He contributed the sections on bones and joints as well as those on the gastrointestinal system and accessory organs of nutrition in Piersol's anatomy. He made an extensive study, extending over several years, on the size of the articular surfaces of the long bones as a characteristic of sex, proving that the size of the articular ends was smaller in the female, and could be used as a means of identi-

fication. He was interested in the question of the estimation of height from the parts of the skeleton and on the identification of the human skeleton, and was able to make a practical use of his observations in several medico-legal cases. He wrote several articles on the general range and significance of variations in the skeleton and also on the question of mutations. One of his earliest publications was an atlas of the frozen sections of a child, which were among the first frozen sections to be made in this country. He always laid great stress on the importance of such sections in anatomical study and made many series for the department and for the museum. In addition to his work on the skeleton he wrote many other papers on anatomical subjects. He wrote several other monographs on subjects not strictly anatomical. Among these were a biographical sketch of Sir Richard Owen, a reminiscence of Dr. Holmes as a professor of anatomy, papers on contortionists and right-handedness, and several others on the methods of instruction in the Harvard Medical School, its policy as to the increase in the number of professors, and on changes in its medical curriculum.

Dr. Dwight devoted much of his time to the development of the anatomical part of the Warren Museum in the Medical School. It was his hope to be able to arrange the anatomical specimens so as to show the normal variations of all parts of the body. His collection of corrosions and frozen sections was very extensive, and he had made much progress with variations of the large vessels, the kidneys and the joints. Under his supervision, enlarged papier-mâché models of the skeleton and abdominal viscera were constructed which have proved of great value in teaching. He was very proud of the museum and always impressed on his classes the practical value of a museum for the study and teaching of anatomy.

Dr. Dwight gave two courses of lectures at the Lowell Institute at Boston,—one in 1884 on the mechanism of bone and muscle, and another in 1889 on the significance of variations in the human body. From 1898 to 1908 he was a trustee of the Boston Public Library and gave freely of his time to aid in its development. He was much interested in that part of the library devoted to Catholic books and literature, and the expansion of this department was due chiefly to his efforts. He was president of the Association of American Anatomists in 1894, and was

also one of the original members of the editorial board of the *American Journal of Anatomy* and held this position until his death. From 1873 to 1878 he was an editor of the *BOSTON MEDICAL AND SURGICAL JOURNAL*. Besides the Association of American Anatomists, he was a member of the American Society of Naturalists, Fellow of the American Academy of Arts and Sciences, a member of the St. Thomas Aquinas Academy of Philosophy and Medicine of Rome, an honorary member of the Anatomical Society of Great Britain and Ireland, a member of the American Medical Association, and a former member of the Massachusetts Medical Society and several other medical societies in Boston. In 1889 he received the degree of LL.D. from Georgetown University.

In addition to his work in the Medical School, Dr. Dwight took an active part in the affairs of the Catholic church, of which he was a member, and was especially interested in the Society of St. Vincent de Paul. He joined the Holy Cross Conference in 1881, became its vice-president in 1884 and president in 1887. This position he resigned in 1892, but continued to remain a member. He was chosen president of the Central and Particular Councils of Boston in 1899 and held the former office until his death. He devoted much of his time to his religious work and to this society, and did much to further its welfare and influence. Dr. Dwight gave several addresses at meetings of the St. Vincent de Paul and other Catholic societies and conferences, notably one in 1908, before the American Federation of Catholic Societies at Boston, on the relations of the church and science. He completed a book entitled, "Thoughts of a Catholic Anatomist," in the winter of 1911, and had the satisfaction of seeing it published before his death. This book contained his theories on evolution and his opinions on the relations between Catholic thought and science. His deep religious feeling and his devotion and loyalty to his faith were his strongest characteristics and influenced to a great degree his opinions and his scientific point of view.

He had the good fortune to find the specimen of a free euroides secundarium in one foot in the winter of 1910, and the unique specimen of that bone as a free element in both feet the following winter. The paper he wrote on the latter and another on irregular ossification in the transverse process and the rib at the junction of neck and thorax were his last contributions

to anatomical science. He always looked forward to meeting his classes at the first exercise in their medical career, and although in the summer he knew he was failing, still hoped to meet the class of 1911 at least once in the fall. This opportunity was denied him and his death occurred three weeks before the opening of the term, at his summer home, Nahant, Mass., September 8, 1911.

JOHN WARREN, M.D.

## Book Reviews.

*Röntgenotherapy.* By ALBERT FRANKLIN TYLER, B.Sc., M.D. St. Louis: C. V. Mosby Company. 1918.

This volume on "Roentgenotherapy" is designed primarily for beginners in the study and practice of roentgenotherapy. The apparatus which is necessary for treatment is described and illustrated in order to make the mechanical and electrical aspects of roentgenotherapy familiar to the student. The interrupt-less transformer and the Coolidge tube are described with particular care, and methods of arranging the apparatus, of estimating dosage, and of treating different conditions are considered. The author classifies diseases according to the technic required for their treatment: superficial therapy is applicable to such conditions as are presented by eczema, lupus vulgaris, ringworm, and ulcers; diseases in which it is necessary to reach the deeper tissues, such as angiomata, tuberculous glands, uterine fibroids, and malignant growths, require deep therapy treatment. These conditions are carefully described and are illustrated by many case histories observed during a period of ten years of the author's experience.

*Johnson's Standard First Aid Manual.* Edited by FRED B. KILMER. Eighth Edition, revised. New Brunswick, N. J.: Johnson and Johnson. 1918.

Among the numerous books recently published presenting methods of first aid treatment in emergency cases, "Johnson's Standard First Aid Manual," of which this is the eighth edition, is one of the most valuable. The collaboration of many first aid teachers and workers, experienced in railway, mining, police, and ambulance service throughout the country, has made this book the expression of the most varied, recent, and eminent opinion. Directions are given for the preparation of home-made appliances and of material most likely to be found at the place of accident. Emphasis is laid on the fact that first aid treatment does not include the treatment of injuries, the administration of medicine, and the diagnosis of disease—rightly the

province of the physician. This manual does not attempt to give instruction in anatomy, physiology, or surgery. This eighth edition, improved in arrangement and simplicity and by additional illustrations, presents with unusual clearness a comprehensive view of standard first aid measures.

*The Disabled Soldier.* By DOUGLAS C. McMURTRIE. New York: The Macmillan Company. 1919.

This book describes in a manner interesting to the doctor and to the lay reader as well the growth of public concern in the rehabilitation of the disabled man. Up to the present time, public opinion has almost taken for granted that the cripple and helpless should be objects of charity; that physical handicap was a barrier to a great many educational advantages and consequently to a useful place in the world of work. Dr. McMurtrie, however, in the presentation of the result of eight years' study of the possibilities of reconstruction, gives us a most optimistic view of the situation. Coming to print, as it does, in a time of world-wide interest in the disabled soldier, this volume fills a distinct need. A brief history of the social attitude toward the cripple is given at the beginning of the book and throughout each chapter the spirit of hopefulness and courage impresses itself on the reader. Twenty-five illustrations, most of which are actual photographs, prove that such development accomplished in schools like the Red Cross Institute for Crippled and Disabled Men, especially for the returned soldier, is thoroughly practical and not merely theoretical.

*The Human Skeleton.* By HERBERT EUGENE WALTER. New York: The Macmillan Company. 1918.

This book has for its purpose the description and interpretation of the human skeleton. It is a theoretical comparison of what the skeleton is at present, and what it was, and what it may become from the point of view of the biologist. The method of presenting this subject for use as a textbook is interpretative and one which tends to lead to a desire for a better understanding of this important part of the human machine. The book is divided into eleven chapters and contains seventy-five descriptive illustrations. The study of physical types, the comparison of man with the higher animals and the various stages of skeletal rôle are discussed by the author under the following headings: The Make-up of the Skeleton, Nature's Experiments with Skeletons (discussing skeletal evolutions), External Skeletal Trimmings, The Oldest Part of the Skeleton, The Thoracic Basket, Evolution of the Brain Case, The Human Skull, Fashions in Skulls, The Locomotor Skeleton, and The Handy Foot and The Makeshift Foot.

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## AGRICULTURAL AND INDUSTRIAL TUBERCULOSIS COMMUNITY.

THE importance of the problem of reeducating and finding suitable employment for discharged soldiers afflicted with tuberculosis has been recognized by the Federal Board for Vocational Education. A study has therefore been made of the possibilities in a plan for an agricultural and industrial community for tuberculous people who are able to work. An article written by H. A. Pattison, M.D., and issued under the direction of the Advisory Committee of the National Tuberculosis Association, presents valuable observations on this subject.

Although the campaign against tuberculosis has accomplished a great deal, it is recognized that there have not been developed adequate plans and facilities for the post-sanatorium treatment of patients. It is difficult for a patient, after living according to a proscribed regime in a sanatorium, to adjust himself to his

environment on his return home so that his new life will not result in reactivation of the disease. It is probable that his chances for permanent arrest would be greater if he could work and associate with men governed by physical limitations like his own. His work, rest, play, and all his activities should be carefully guarded for a number of years.

There are some men and women who can resume their former occupations without endangering their health; others can regain their strength only by finding new vocations; but practically all require, for a while, part-time work under medical and nursing supervision in a well chosen environment. For this little provision has been made, and the suggestions which have been offered for the organization of colonies should receive careful consideration. An attempt to develop a plan for a complete village for tuberculous persons has been made by Dr. Bayard T. Crane, president of the Rutland Private Sanatorium Association. The association owns ninety acres of arable and wooded land, upon which there are a farmhouse, barn, some stock, a dairy, and farm implements; a residential, recreation, and workshop building has been built and partly equipped. Other industrial committees have developed in this country. Many have grown about a single industry for the sake of that industry. Would it not be possible, however, to develop industries around a community for the sake of that community? By this means, arrested cases of tuberculosis among soldiers, sailors, and civilians could be employed and yet without injury to their physical condition. The author of this article proposes that a modern village be laid out to care for five or six hundred people immediately, with a possible expansion to four thousand. There should be an efficient department of health, and diagnostic, pathological, and research laboratories. As the population should be drawn from the sanatoria of neighboring states, a sanatorium should be built in or near the village. Schools of the open-air type should be constructed. The development of industries is of prime importance, and the possibilities of employment for tuberculous patients are many and varied. Agriculture, too, is another possibility, although very often the work proves to be too hard for this type of person.

The inauguration of such an agricultural and industrial community offers many possibilities, which agencies engaged in war reconstruction

work may find useful in solving some of the difficult problems involved in the reëducation and employment of disabled men.

### AMERICAN JOURNAL OF CARE FOR CRIPPLES.

The *American Journal of Care for Cripples*, volume eight, number five, contains a number of articles both interesting and instructive. The first, by Gustave Schulz, describes the status of the cripple in primitive society. From earliest history, the cripple has called forth emotions of mingled aversion and sympathy. His position in primitive society has always been precarious, both because his deformity has been looked upon with repugnance and superstition, and because of his economic uselessness. Conditions have not always been as they are today among civilized peoples, when these men cannot be supported in idleness by Governments nor can industry afford to dispense with their latent productive power.

The attitude of contemporary primitive society toward the hopelessly dependent, the accidentally disabled, and the congenitally deformed is still far from commendable. Among the Eskimos, probably because it is an economic necessity, individuals who are a burden to the community may be killed. In some parts of the world, normal new-born infants and old and infirm people, as well as stunted or idiotic persons, are included among the helplessly dependent and killed, not so much from any innate disposition to cruelty as from the material exigencies of primitive life. It is also true that this custom is often continued for superstitious reasons after there is no longer need for it on the ground of material necessity. Accidental cripples appear to lose their social standing together with physical usefulness. We hear little of this type of person in primitive society. One reason may be the fact that the savage often prefers to die with a limb on than live without it, believing as he does that if he becomes crippled in this world he faces the next with a like deformity. Among primitive war-like peoples, death is preferred to the social degradation which accompanies serious physical handicap. In the case of the congenitally deformed, it is customary for the appearance of anything unusual to be apprehended by the savage as a manifestation of some higher

dreaded power, and physically abnormal children are regarded as in some degree incarnations of the "unknown." Congenital deformity is regarded as a consequence of some transgression against the wishes of the gods. A number of myths are quoted in this article to illustrate primitive belief and customs.

This number of the *American Journal for Care of Cripples* contains several studies of conditions resulting from the war. The problems which a civilian sanatorium must face in the treatment of soldiers are considered by Captain J. Roddie Byers, C.A.M.C., in his article, "Occupation and Industrial Training of Tuberculosis Cases in Sanatoria." "Le Jouet de France," by Captain Edward A. Hackett, describes, through the story of a war-cripple's venture into the toy-making industry, the aims of a group of workers in France. The problem of treating and training discharged disabled men in England is discussed by Hon. Edward H. Cozens-Hardy. "Employment of the Disabled," by Dr. Granjux, and "Reëducation of the Disabled in the Institutions of the French Ministry of Agriculture," by Agricultural Inspector Chanerlin, indicate a recognition of the many problems yet to be faced, and intelligent interest in their solution.

### CHILD WELFARE IN FRANCE AND GERMANY.

The *British Medical Journal* has published in a recent issue an article of considerable interest on the child welfare measures which were adopted in France and Germany during the war. Before the outbreak of hostilities, regulations regarding the employment of women in factories were carefully enforced; but with the increased demands of war upon industry, consideration for the future was sacrificed to the exigencies of the present, and palliative rather than preventive measures seemed to be the best which could be expected.

In order to mitigate some of the existing evils, efforts were made to enable the woman who was needed in industry to be, also, a mother. The number of nursing rooms were increased in both France and Germany, and crèches for older infants not at the breast and for older children were organized with some attempt at providing medical supervision. Nursing rooms and



crèches were established as near as possible to the factories where the mothers worked. Furthermore, in 1917, a law was passed by which employes were required to grant special resting periods for mothers for nursing their children. For children of pre-school age, day shelters were provided in Germany, and infant schools with playgrounds in France; as the war progressed, these advantages were more and more extended to all children.

These measures, it must be admitted, met with opposition and were carried out to the full with difficulty. Working mothers generally did not seem inclined to trust their children to the institutions, possibly because of the defective medical and nursing care provided. On the other hand, the workers in the institutions were poorly rewarded, and it was difficult to obtain trained workers. Consequently, in both France and Germany, in the majority of cases children were intrusted to the care of relatives and neighbors. The need for supervision was recognized, however, and enforced to some extent. In Mannheim, for example, a nurse visited the homes of these foster children regularly, and they were examined periodically by physicians appointed for that purpose.

In both countries, but more particularly in France, measures were taken to help the mother to be a mother. For example, the law of 1913, which has provided optional rest for women before confinement, was altered to make this rest obligatory for women employed in war factories. In France, an allowance from the public funds was available for mothers who were in need of it, for eight weeks, at least four of which had to be after childbirth. In Germany, a law was passed providing for maternity grants, to be given through the sickness societies to all women who were employed in industry. Arrangements were made at the French munition factories so that every woman who had been employed in the factory for more than three months should receive full wages during four of the eight weeks.

In both France and Germany, the realization of the dangers due to neglect in the care of child life became more fully recognized as the war went on, and increased effort was made to meet and to prevent these dangers. The expectant mother was made to feel that it was a national duty not to neglect herself and her unborn child. Now that the war is at an end and married women will no longer need to work in munition

factories, would it not be well to consider how far the measures which were adopted for their comfort and safety during the war may be continued in time of peace?

#### MEDICAL NOTES.

INFLUENZA AMONG THE ESKIMOS.—Details of the epidemic of influenza among inhabitants of Eskimo settlements in Labrador last winter have been furnished by northern missionaries. It has been reported that in one settlement, all of the one hundred inhabitants became ill, and in a week, eighty-six died, leaving only eight children, five women, and one man surviving. Because of the great numbers of dead and the weakness of the survivors, there was extreme difficulty in disposing of the dead.

INFLUENZA AT THE NEW JERSEY STATE VILLAGE FOR EPILEPTICS.—A report on the influenza epidemic at the New Jersey State Village for Epileptics, published in the *Public Health News* bulletin of the New Jersey Department of Public Health, records data concerning the cases at this institution. When the first case occurred, there were seven hundred and sixty-eight epileptic patients and sixty-eight employes distributed in fifteen dwellings. In addition to these, there were sixty-four persons living in the eight dwellings occupied exclusively by employes and their families, thus making a total population of nine hundred. Among this number, there were four hundred and twenty-two cases of influenza and sixty-seven deaths. It is probable that nearly all of the persons residing in the village were exposed to infection at some time during the epidemic.

The outbreak of the disease extended over a period of sixty-four days, from September 25 to November 27. More than forty-six per cent. of the entire population of the institution contracted influenza during the epidemic. The case incidence was considerably higher among inmates, epileptic patients, than among employes. The highest case incidence is shown among persons between the ages of ten and twenty, and a marked and continuous decrease occurred in the case rate in each five year period from twenty-five to sixty years. Distribution of cases by sex shows that 58.8 per cent. of the male population and 41.1 per cent. of the fe-

males contracted influenza. The fatality rate of all cases was 15.8 per cent. The case incidence among the vaccinated and unvaccinated was practically the same; while the fatality rate was substantially lower among the cases that developed after the third vaccination than it was among cases that occurred in unvaccinated persons, it is believed that this was not true in a sufficient number of cases to warrant a conclusion that vaccination produced this result.

**EVOLUTION OF SCIENTIFIC MEDICINE IN THE UNITED STATES.**—In the *British Medical Journal* is briefly reported an address by Sir William Osler, in which he outlined the evolution of scientific medicine in the United States. He stated that it may be divided into four periods. The first, the British period, to 1820, was concerned with medicine in old colonial days, showing the influence of Edinburgh and of John Hunter, and coming down to the New England group represented by Jacob Bigelow and James Jackson. The second, French, period extended from 1820 to 1860, when the influence of Laënnec and Louis was supreme. Of the third, German, period, extending from 1860 to 1890, the main features were specialism at the Vienna school, the teaching of Virchow and Koch, and the work of Traube in experimental medicine. The fourth period is the American, from 1890 to the present day, its chief features being the reorganization of hospitals as integral parts of the university system, and unit and team work illustrated in the clinics of Cushing, Halsted, and the Mayo brothers.

**KASHMIR MEDICAL MISSION.**—The *British Medical Journal* has summarized the work of the hospital at Srinagar during the year 1917. The hospital contains 150 beds, including 40 for women, and from 10 to 20 are usually occupied by children. The following is a summary of the medical and surgical work:

New out-patients, 16,159; total attendance, 38,934; in-patients, 1,719 (1,345 surgical and 374 medical). The surgical operations numbered 4,113 and there were 28 deaths. There were 23 deaths from medical diseases. Of 938 major operations, about 200 were on the eye, including 96 for cataract. The number of cases operated on for epithelioma was 101, almost all of the Kangri burn type. In 1917 the Durbar made a grant of 4,000 rupees, which was particularly acceptable as a mark of

state recognition of the work of the hospital. In the Kashmir State Leper Asylum there were 106 patients at the beginning of 1917; during the year 110 new cases were admitted, making a total of 216 (161 men and 55 women). Sodium gyioecardate is in regular use; of eight cases treated for eight months, there were signs of improvement in five. Three patients who had been in the hospital for some years under various treatment, including nastine, were pronounced to be definitely cured. The value of the work of medical missionaries in India is great.

#### BOSTON AND MASSACHUSETTS.

**WEEK'S DEATH RATE IN BOSTON.**—During the week ending July 27, 1919, the number of deaths reported was 155, against 221 last year, with a rate of 10.15, against 14.69 last year. There were 20 deaths under one year of age, against 54 last year.

The number of cases of principal reportable diseases were: Diphtheria, 43; scarlet fever, 9; measles, 15; whooping cough, 24; tuberculosis, 30.

Included in the above, were the following cases of non-residents: Diphtheria, 12; scarlet fever, 3; measles, 1; whooping cough, 1; tuberculosis, 1.

Total deaths from these diseases were: Measles, 1; whooping cough, 1; tuberculosis, 12.

Included in the above, were the following non-residents: Measles, 1; whooping cough, 1.

**NEEDS OF RUSSIAN REFUGEES.**—The Boston Committee for Refugees in Russia has received word that important work is being done in Constantinople in the repatriation of Russian refugees to the Caucasus, and in coöperation with the British and American authorities in relieving the distress caused by the sudden evacuation of Odessa by the Allied forces and the capturing of the Crimea by the Bolsheviks. A report which has been received recently states that there are hundreds of orphan children in South Russia without clothing.

**PETER BENT BRIGHAM HOSPITAL.**—The fifth annual report of the Peter Bent Brigham Hospital for the year 1918 shows that in spite of war conditions, the general work of the hospital has been maintained with its usual efficiency and devotion. Thirty physicians or surgeons left the hospital to join the army during the war, and

the hospital has been handicapped by a lack of male help, particularly ward tenders, whose work has been performed to a great extent by nurses.

During the year there have been admitted into the hospital wards 4025 patients, and 7952 new patients have been treated in the Out-Door Department. The Asthma Clinic has had 252 new patients; there have been made 3406 examinations by the x-ray department, and 3345 by the serological laboratory; 1981 ambulance calls have been made. The financial report shows that the total operating expenses for the year have been \$320,547.28, and receipts from patients have amounted to \$154,026.47; for the year 1917, the operating expenses were \$323,777.72, and receipts from patients, \$138,512.48. The number of free cases have increased during the year by 204, the part-pay cases have decreased by 352, while those who have paid in full amount have increased 498.

The School of Nursing increased the size of its classes owing to the war. Twenty-seven applicants were admitted in January, 20 in May, 28 in September, making a total of 75 probationers admitted, of whom 33 have been accepted into the school and 23 start on the wards in January. The school census has been as high as 145 this year. At the request of the Red Cross, a course for nurses' aides was organized and the number of hours increased from 72 to 240. On May 1, the number of nurses sent to the New York Nursery and Child's Hospital was increased to five. The faithfulness of the nurses during the influenza epidemic is greatly to be commended.

The Social Service Department has carried on its work during 1918 amid unusual hardship and sorrow. A detailed report of several patients illustrates the type of medical social service rendered by the workers of this department. The assistance given by the Woman's Motor Detachment of the American Red Cross has been of inestimable value.

The report of the pathologist records 300 deaths in the medical service of the hospital and 71 in the surgical service. Forty-five autopsies, based on 372 deaths, were performed and gave a percentage of 40— for the year. The increased number of deaths during 1918 was due to the epidemic of influenza. There were 2,224 surgical and bacteriological examinations. Research work on Rocky Mountain spotted fever and on influenza has been conducted during the year.

In the absence of Dr. Harvey Cushing, surgeon-in-chief of the hospital, and because of the subsequent changes and the diminution of the staff, the work of the surgical service has been conducted under difficulties. It was only through the untiring effort and devotion of those who remained at home that the professional service of the department has been maintained at its usual standard. There were 1777 patients admitted to the surgical department during the year, and a total number of 1474 operations were performed. The surgical out-door department cared for 3574 new cases and there was a total of 23,321 visits. The number of patients treated both in the hospital and in the out-door department was less than in the preceding year, a situation which probably can be explained by the fact that during the influenza epidemic the amount of surgical work done was reduced to a minimum. The department conducted weekly clinics for groups of medical officers who had been sent to Boston for the study of orthopedic surgery, and the surgical instruction to students of the Harvard Medical School was continued. A new plan was tried with success in the administration of anaesthesia, this work being entrusted to house officers during their second rather than during their first periods. This report emphasizes among the requirements which will be necessary for the future development of the surgical service the need for proper accommodations for study and for private offices for the junior members of the visiting staff.

The medical department, although confronted by the same difficulties which the war has caused in other departments, was able to continue its efficient service to patients. It has been pointed out, however, by the physician-in-chief that complacency arising from satisfaction about what has been accomplished during the war should not retard new projects and investigation. The needs of this department are an increased number of house officers, residents, staff assistants, and opportunity for enlargement. Of most importance during the year was the influenza epidemic. The situation arising from the seriousness of this epidemic was made even more difficult by the fact that more than half of the nursing and medical staffs suffered from the disease. From September 9 to December 31, 557 cases were treated, of whom 153 died. The unfaltering service of the nurses who served during this epidemic merits deep gratitude and praise. The

total number of medical admissions to the hospital during 1918 was 2406.

The work of the out-door department has been conducted as usual in spite of the many changes in the staff made necessary by the war. The cardiac, diabetic, and renal classes have been attended regularly. A bronchial asthma clinic was conducted and 252 new patients studied and treated.

The report contains a list of scientific publications which have been contributed by members of various departments during the year. Statistical tables of medical and surgical diseases and operations indicate the types of cases cared for, and the histories of fatal cases are reviewed. This record of work accomplished under most trying conditions, at a time when war and epidemics greatly increased the demands upon a limited staff, reflects the spirit of coöperation and unselfish devotion in the performance of the service rendered by the Peter Bent Brigham Hospital.

#### NEW ENGLAND NOTES.

WAR RELIEF FUNDS.—The principal New England War Relief funds have reached the following amounts:

Jewish Relief fund . . . . .	\$2,524,196.58
French Orphanage fund . . . . .	508,644.96
Italian fund . . . . .	299,185.58
Serbian fund . . . . .	140,482.09

### Miscellany.

#### APPOINTMENTS IN THE MEDICAL CORPS.

At the present time there are six hundred vacancies in the Medical Corps, Regular Army. The following circular, number 346, has been published in order to provide for a method of filling these vacancies. An examination will be held, for which only emergency medical officers who have served during the war are eligible. It is the present intention of the War Department to hold this examination on Aug. 25, 1919, and consideration can not be given to any application which is not received in time to enable action to be taken on it by the Surgeon-General prior to August 16th.

#### APPOINTMENTS IN THE MEDICAL CORPS (PERMANENT ESTABLISHMENT.)

1. For the purpose of filling existing vacancies in the permanent Medical Corps, United States Army, applications will be received by the Adjutant General of the Army, from those who desire appointment. In view of the large number of vacancies existing, appointments will be made as expeditiously as possible, so much of Circular No. 21, War Department, 1919, as is in conflict being rescinded. There are no vacancies in the Dental Corps, Veterinary Corps, or Sanitary Corps, to be filled at this time.

2. Vacancies will be filled by appointments in the following order:

a Emergency medical officers now in service.

b Members of the Medical Section, Officers' Reserve Corps, who served with credit as officers during the war.

c Former emergency medical officers who served with credit during the war.

3. Section 10, Act of Congress approved June 3, 1916 (Bul. No. 16, W. D. 1916), as amended by Act of Congress approved August 29, 1916, (Bul. No. 33, W. D. 1916), requires that persons hereafter commissioned in the Medical Corps shall be citizens of the United States, between the ages of 22 and 32 years, and original appointments shall be in the grade of first lieutenant.

4. All applicants whose applications are considered satisfactory will be authorized by the Adjutant General of the Army to appear before a convenient examining board to determine their fitness as to mental, moral, physical, and professional qualifications. Applications will not be approved in those cases where, on September 30, 1919, the applicant will be more than 32 years of age.

5. All persons eligible for and desiring appointment should address a letter of application for examination to the Adjutant General of the Army without delay. The following data will be furnished by applicants, and any less than the data enumerated will not be considered satisfactory and will lead to delay:

a Name in full. (Initials not acceptable.)

b Date of birth.

c Place of birth.

d Permanent home address.

e Medical school or schools from which graduated with dates.

f Professional experience.

g If an officer who has served during the emergency, complete statement of military service, setting forth (1) the organizations in which served and inclusive dates, (2) present organization if still in the service, (3) grade in which originally appointed, (4) present grade if still in the service, (5) date, place of discharge, and rank at time of discharge if no longer in the service.

h Statement of any service as a contract surgeon, in the Medical Reserve Corps, or in the Medical Section, Officers' Reserve Corps.

i In cases of alien birth: (1) documentary evidence of naturalization, (2) if naturalized through parent, documentary evidence of father's naturalization and sworn statements from two reputable United States citizens establishing relationship between candidate and his father.

6. Applications from candidates still serving as emergency officers will be forwarded to the Adjutant General of the Army through military channels. Strict compliance with the provisions of paragraph 786, Army Regulations, is enjoined.

7. Applicants not in military service must appear for examination without expense to the Government.

8. After consideration of their applications, selected applicants will be sent letters authorizing them to appear for examination. Examining boards will be convened by instructions from the Adjutant General of the Army and will follow such procedure as may be directed by the Surgeon General of the Army.

9. Applicants in Europe will address their applications to the Commanding General, American Expeditionary Forces, who will cause the examinations to be held and records thereof to be forwarded to the Surgeon General of the Army.

(210.1, A. G. O.)

By order of the Secretary of War:

PEYTON C. MARCH, General.

Chief of Staff.

Official:

P. C. HARRIS, The Adjutant General.

# The Boston Medical and Surgical Journal

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### Address.

#### CONSECUTIVE OR INTERRUPTED HOSPITAL TRAINING FOR PUPIL NURSES.

BY ALFRED WORCESTER, M.D., WALTHAM, MASS.

FROM this question there is a serious difference of opinion. Most training schools in this country require at least two years of consecutive hospital training, on the ground that thus and only thus can the nurse be properly trained for her future work. The Waltham Training School for Nurses, on the other hand, believes that it is an educational advantage to interrupt the hospital training of its pupils by a few months of training in home nursing. But, as this school stands almost alone in this country in so believing, and in shaping its curriculum accordingly, it is only proper to explain its reasons for not conforming to the generally accepted standards of the nursing profession. This becomes more important in view of the present and threatened extension of the ostracism of Waltham graduates, on this ground alone, from State and National Associations of Nurses, and so from many kinds of public service.

The Waltham School, now in its thirty-fifth year, was begun with the purpose of educating young women to serve all the nursing needs of

the community. That is still its ideal. It has never believed that hospital nursing is more than one of the community's needs or that hospital training alone best fits a nurse for nursing patients in their own homes.

For many years it was the only school in this country to train its pupils in district visiting nursing. Finally the best of the hospital-owned schools concluded that such training might be considered a proper part of a nurse's education, though previously they had stoutly maintained the absurdity that a purely hospital training was all-sufficient for subsequent visiting nursing service. In the same way most of the schools now maintain the equal absurdity that hospital training properly prepares nurses for private family nursing. The schools that have begun to recognize this as a mistake think they are obviating it when they give their pupils some service in the private wards where they may have the experience of individual nursing. No doubt this is a step forward; but such service no more fits a nurse for private family nursing than it fits her for visiting nursing.

Nursing is an art that can be learned only by practice, and it is therefore evident that in order to become first rate all round nurses pupils should have service, under their teachers, not only in caring for patients of all ages in all kinds

of helplessness but also in all their varying environments. Maternity service does not fit a nurse for contagious service. Medical nursing is different from surgical. So, too, the nursing service needed in a modern palace where all possible materials are at hand is different from that needed in the ordinary home. And nursing in hospital wards, where trained assistance is available, is very different from that needed where the anxious members of the family, if not taught how to help, will surely hinder. Even admitting, what is very questionable, that an exclusively hospital training perfectly fits a nurse for hospital service, it certainly is true that nursing in the patient's own home wonderfully develops the pupil nurse's character. It broadens her sympathies and forces her to use all that she has been taught. She thus becomes more tactful, more resourceful, more useful.

Indisputable as this is, it is not generally admitted by the so-called leaders of American nursing. They no longer openly object to an insistence upon the importance of private nursing as a part of the pupil nurse's training but they do object to its interrupting the course of hospital training. Thus, in the case of Waltham, they do not deny that the nurses are well trained, even in their hospital service, but they ostracize the graduates, in order, as they freely admit, to force the school to change its curriculum so that the two years of hospital training shall be consecutive. Although the Waltham pupils have one full year of hospital service, immediately after their preparatory course of four months, (a course, by the way, now partially copied by other schools which formerly derided it as not being a proper part of the pupils' institutional training), and although later they have a second full year of hospital service, these two years do not count in their favor; their training in that branch of nursing has been interrupted, and so their school is condemned and they with it.

This condemnation is no light matter. For because of it the graduates from Waltham are debarred from membership in State and National organizations and from registering as trained nurses in some of the States. Even where these privileges have been allowed, and where previously they could enter special post-graduate educational courses as well as the public service, they are now informed that these privileges and opportunities have been or will

be taken away, *unless* the Waltham school conforms to the fetich of consecutive instead of interrupted hospital training. For instance, two years ago, the Waltham nurses were accepted for enrollment in the American Red Cross. But now they are informed that their acceptance was only a war measure and that the National Committee in charge of the department of nursing may prefer to reconsider the decision to admit them. The assistant director of the department, Clara D. Noyes, can see no injustice to the Waltham graduates in refusing to recognize them as fit for Red Cross enrollment, because to recognize them "would only encourage the Waltham school to continue its undesirable method of preparing nurses." And she further states that the question of their eligibility hinges only upon their hospital training not being consecutive.

For many years the Waltham graduates have been members of the Massachusetts State Nurses' Association, which they were from the first invited and urged to join. Some of them have been elected as officers. Now, the secretary, Miss M. E. P. Davis, informs those who apply that "your training school (sic!) is not eligible for membership."

Is this American fair play or is it an imitation of Prussian Kultur? Is it likely that the Legislature of Massachusetts will grant to such an association the enlarged supervisory power that it seeks?

The five hundred Waltham graduates either are or are not well trained nurses. Their fitness for enrollment in the Red Cross, for State registration, for public service, or for membership in nursing associations, surely can be neither determined nor changed by the future course of the Waltham School.

Even allowing that fitness for practising nursing, or any other profession, can be determined not by any examinations of the candidates but only by the character of the schools that gave them diplomas, no subsequent change in their schools can affect the question. What if a school, that has previously conformed to the arbitrary standards of these nurse-leaders, should in future dare to follow Waltham's lead in this method of training (as Waltham's lead in other respects has already been followed by many of the more advanced schools), would the previous graduates of such a school then have to be thrown overboard?

Returning to the subject of the interruption of the pupil nurse's hospital training, which the Waltham school believes to be one of the excellences of its method, what right or reason have the graduates of schools that give only hospital training, and so of course give it consecutively, to use their official positions to force the Waltham School to surrender this or any other of its ideals?

Would schools of law, of medicine, or of theology submit to dictation as to where in their curricula any particular branches of their professions should be taught, or as to the consecutiveness of such courses?

The eritics of the Waltham School, as has already been pointed out, do not openly object to the instruction given in home nursing, although it is perfectly plain that they do not recognize its importance. They are willing it should be given after the hospital training, but not intermediately. Let us consider their objections. Here they are:

1. *No pupil nurse should be sent to outside service until fully trained.* If this objection is in the pupil's interest, it will be sustained by those who believe that only those who can swim should go near the water. If it be in the interest of the families where pupil nurses would be employed, the answer is that after more than a third of a century the Waltham School cannot begin to meet the demands of neighboring families and their physicians for this kind of service.

2. *Such employment of pupil nurses is in unfair competition with graduate nurses.* This low objection is one of the worst features of tradesunionism applied to a profession. Any force that it might have would be local and would be felt most by the Waltham Graduate Nurses' Association. Its members, on the contrary, favor it, for they appreciate what the experience and the acquaintance with families meant to them when they were pupils.

3. *The earnings of pupil nurses belong to them and not to the proprietors of their schools.* This objection is a veritable boomerang for the hospital owned schools, which often have been started and are generally maintained primarily for their pecuniary benefit, and only secondarily for the education of their pupil nurses. True, they partly atone for this injustice by meagre money allowances to their nurses "for necessary expenses." This also serves to

keep them in a sort of servant status, which some hospital superintendents maintain is very desirable. In the Waltham School, on the other hand, every dollar of the pupil nurses' earnings, whether in hospital or private family service, has always been used for the support of the School. But, besides these pupils' earnings and the income from the endowment, the School has always had to depend upon annual donations for its maintenance. During the last year \$5,000 was asked for, and \$10,000 was immediately raised by popular subscription. Evidently the community whose nursing needs are served by the School does not side with those who know little about it.

4. *Many less worthy training schools claim to be followers of Waltham methods and so entitled to whatever privileges are allowed to Waltham graduates.* Doubtless it would be easier for the powers-that-be with one fell swoop to ostracize such schools by refusing to recognize the Waltham School as entitled to simple justice. But must Waltham lower its standards and render its course less effective, merely to save these ladies from their present embarrassment? Had Waltham heeded their past criticisms, its preparatory and visiting nursing courses would have been sacrificed.

5. The last, and in reality the only objection entitled to serious consideration is that *not having consecutive hospital training is an educational disadvantage.* If the sole aim of schools of nursing is to educate their pupil nurses for future hospital service, and again waiving the question if, to this end, training in no other branch of nursing is an advantage, this contention of the exclusively hospital trained leaders of nursing must be admitted. But this is not the aim of the Waltham School. It aims rather to train its pupils for all kinds of future nursing services, and it recognizes the fact that nine-tenths of the nursing service needed is outside of hospitals.

Is it not probable that a school with such aims, and under the sole control of a faculty of graduate nurse teachers, is able to decide what is the best place in its curriculum for the training in home nursing? In deciding as they have, several of these teachers have had direct advice from really great teachers of nursing, among them, Florence Nightingale, who particularly urged the Waltham School to emphasize the training of pupil nurses in home

nursing in just this way—by giving it *before* the completion of their hospital training. This, in her opinion, was the only way to offset the unfortunate drift of modern nursing towards an exaggerated institutional professionalism.

The Waltham School has proved by long experience the wisdom of this advice. It has found that after a full year of hospital training some of the pupil nurses are tired out and discouraged, while others are enamored of hospital life or of their associates. They need first a good vacation and then an entire change of service. They need an enlarged vision of life and a realization of the fact that not the individual but the family is the real human unit. They need to learn that hospital ways are not the only ways of caring for patients and that there are many other kinds of helplessness than such as hospitals admit. The Waltham School has found further that pupil nurses before they have finished their hospital service are far more teachable in home nursing than they are afterwards, when they are too apt to think they know it all. Moreover, as during their second year in the hospitals the pupil nurses serve as head nurses, and so as the immediate teachers of their juniors, the School prefers to have this as their last or finishing course. The breaking up of intense friendships and antipathies, by a few months of separation from their hospital associates, and the avoidance of placing some as head nurses over their own classmates, have been found to be of no small advantage.

It is not claimed that the hospitals prefer such an interrupted curriculum. On the contrary, they dislike it. Naturally, it would be easier for them if, in the interest of the pupil nurses, no changes whatever had to be made in their assignments to different services.

All systems of education and methods of training must be judged by their fruits. The Waltham School is perfectly willing to be so judged. Are the graduates of this school, or are they not, good nurses? Have they failed or have they succeeded as private family nurses, as district visiting nurses, as public health and industrial nurses, as teachers and superintendents of nurses, and as hospital matrons and superintendents? Are they, in short, the kind of nurses wanted by the medical profession and by the people? Are any other graduates more in demand? Have any others won higher hon-

ors? The Waltham School believes that every one of these questions can be answered only in its favor.

## Original Articles

### THE TREATMENT OF EARLY AND DOUBTFUL CASES OF CANCER.\*

By ROBERT B. GREENOUGH, M.D., BOSTON.

Mr. President, Members of the New Hampshire Medical Society, Ladies and Gentlemen:

I THANK you most heartily for the invitation to address this meeting of your Society on some of the aspects of the cancer problem. Cancer is, at present, one of the diseases which arouses the interest and activities of the medical profession, not only because of the increasing frequency of the disease but, also, because we recognize that the measures heretofore employed for its relief have been sadly inefficient, and year by year a greater number of our adult population, many of them in the period of life when their services are of the greatest value to the community, succumb to the disease. When we think that the chances of every individual over thirty-five years of age dying of cancer are fully as great as the risk of death in every patient sick from typhoid fever we begin to appreciate the significance of the disease.

During the past ten or fifteen years much time, energy, and money has been spent in laboratories and hospitals in the investigation of the cause of cancer. As a result of these investigations many unsettled questions have been brought to a satisfactory solution, but the main and important fact in regard to the disease—its cause—is still as much a mystery as it has ever been.

We are living at present in an era of publicity, and the cancer problem has already been exploited before the public to such an extent that in some communities, at least, the laity are better informed in regard to the disease than in the past. Some misapprehensions in regard to cancer have been corrected, and the early suspicious symptoms of cancer have been published so widely that it is believed that the patient

\* Read at the annual meeting of the New Hampshire Medical Society, Concord, N. H., May 14, 1919.



comes to the physician for advice more promptly than was customary fifteen years ago. This is, undoubtedly, a step in advance, but more remains to be done along this line. The state health boards and national societies, like the American Society for the Control of Cancer, are doing what they can to popularize this information, but the work must be fostered and continued if it is to reach to any considerable proportions in the saving of human life. Especially must our medical men, those who are on the front line of the warfare against disease—the family physician—obtain a more accurate and broader view of the cancer problem, for it is only through their assistance that the increased education of the laity can be made effective. To this end the Society for the Control of Cancer has recently prepared a pamphlet for circulation among physicians, giving in a concise form a summary of our present knowledge of cancer as it appears in the different regions of the body. We call the disease "cancer" as if it were one definite disease, like malaria or typhoid fever, but its manifestations in different organs are quite as different in their characteristic symptoms as the infection of tuberculosis is different from that of anthrax or diphtheria. Even in the same organ or situation tumors of different degrees of virulence occur, such that one form may be highly malignant and rapidly fatal whereas another is of such slow progress that as a danger to life it is almost insignificant. These different types of disease must be clearly distinguished.

At the present time the only satisfactory method of treatment of cancer is its removal by a surgical operation. This is the united opinion of the medical world. There are exceptions to this as to all rules, and certain methods of treatment, such as radium, x-ray, or caustic, may reasonably be substituted for operation in the treatment of cancer of superficial type in certain limited situations. The exceptions, however, only go to prove the rule, and the reason for that rule is easy to see. The essential characteristic of cancer is that it is a disease which shows a tendency to extend from its point of origin to other regions of the body. This extension may take place by direct local infiltration, by growth along the lymphatics to the adjacent lymph nodes, by embolic dissemination through the blood stream or the lymphatics,

or by being scattered through the open cavities of the body. It is this characteristic of cancer rather than its appearance under the microscope that determines, finally, its degree of malignancy. Some forms of cancer are so slow in their local growth, and show so little disposition to remote metastases, that to all intents and purposes they are no more significant than would be a benign tumor, while in other cases a minute primary focus of the disease may show such rapid extension to surrounding structures and form so rapidly remote metastases that the duration of life of the unfortunate individual may be limited to a month or two, at most. The moment at which extension begins from the primary focus of disease is quite unknown to us, but we do know that in certain situations this extension occurs more rapidly than in others. Cancer of the tongue is, for instance, earlier in producing metastases in the lymph nodes of the neck than is cancer of the lip, and superficial lesions of the skin of the face may exist for years without extension beyond the limits of the local growth. The first planting of cells in the metastases, however, is of course, of only microscopic size, and it is only after those cells have had a considerable period of growth in the new situation that they produce changes capable of being appreciated by the most delicate methods of clinical examination. During this period of growth, however, other microscopic nests of cells are given the opportunity to extend over a still wider circle and to more distant regions, as the widening circles of wavelets spread out from a splash in the middle of a pond.

It is because of these well recognized and fundamental features of the growth of cancer that the operative treatment is, at present, our only certain method of protection against the disease. By the operative removal of the original tumor, together with the tissues which we recognize by experience in each situation to be the ones liable to the earliest metastatic growth, and by keeping so far outside of the malignant or suspicious tissue that we are certain that our field of operation is in normal tissue, we can remove the whole of the disease and cure the patient, and only by such complete removal of the disease can the danger of recurrence be avoided. When this is done, however, cancer can be removed from the body just as effectively as a benign tumor. It is only a

matter of the extent of the operation. Other methods of destruction of the tumor, as by cautery or by radiation, can sometimes be made effective for the superficial primary manifestations of the disease. The experience of the last few years, however, has taught us that metastatic deposits of cancer, especially squamous-celled or glandular carcinoma, involving the lymph nodes and deeper tissues of the body, are not amenable to destruction by radium or x-ray. So generally is this recognized that the removal of the regional lymph nodes by operation must be practiced even in those situations where, for one reason or another, the destruction of the original superficial lesion by radium or x-ray is attempted.

As a result of an enormous amount of study of the different forms of cancer, operations for the radical cure of the disease in different situations have been elaborated, and virtually standardized. By this I mean that the pathology, the degree and extent of local extension by infiltration, and the probability, location, and extent of glandular or more remote metastasis, have been studied out for cancer in all of its more common situations. As a result of this study we find that, as a rule, the tissues must be removed *en bloc* in order that the entire process—the primary lesion and the regional extensions—may be circumscribed without cutting into any suspicious tissues and thus running the risk of contamination of the wound. Whether the operation is done in Maine or California, the tissues removed in each individual region are practically the same. Different methods of approach, of course, exist, according to the fancy or experience of the individual operator, but the operation for cancer of the lip, or tongue, or breast, is practically standardized for cases which can be recognized as cancer, and which are not already beyond the possibilities of cure by radical operation. It is not necessary here to go more fully into the technique of these standardized operations for cancer in different organs, but we must make use of the fact that operations for recognized cancer have been standardized in the discussion of the appropriate procedure in dealing with early and suspected cases where a positive diagnosis cannot always be established. The fact should be emphasized, also, that the standardization of these operations has resulted from the accumulated experience of surgeons and pathologists

throughout the world, which has determined very definitely the anatomical areas which are to be suspected of involvement by extension from the original focus of the disease for each situation and for each type of malignant tumor which may occur. It is with due regard to these facts that we must base our conduct in the early and doubtful cases in order that we may be consistent, and, especially, in order that we may preserve to the individual patient his best chance for the radical cure of his disease.

It is a trite but essentially truthful statement that the definite and recognizable "text-book" symptoms of cancer are those of cancer which is no longer in its early stages. The accumulated experience of years has shown us that the more positive the clinical diagnosis the more advanced the disease, and the less the probability of cure by operation, and too often the policy of waiting for symptoms which will permit a positive diagnosis results in depriving the patient of her only chance of cure of the disease. Delay in this respect is fatal, and, yet, the situation that confronts us all in dealing with early and doubtful or suspicious cases is one to tax our resources to the utmost. If we are to make material advance upon our present most unsatisfactory results, the waiting method must be abandoned, and safer methods made available. This at once brings up for consideration the exploratory operation. The exploratory operation, however, has in it great possibilities of danger when considered from the point of view of the standard radical operation. When we are dealing with those forms of cancer which involve serious operative risk and grave mutilation if radical cure is to be attempted, as in cases of cancer of the tongue and jaw, or cancer of the uterus, the indications for that serious operation require, both for the sake of the patient and for the sake of the surgeon, a diagnosis better substantiated than merely the suspicion of the disease. In these cases, therefore, the aid of the pathologist must be obtained. In order to obtain this positive diagnosis, however, we must be extremely careful to avoid, in any operative procedure we may undertake, going counter to the fundamental principles of radical operation, namely: to remove *en bloc* the whole of the disease, and to protect the patient from local implantation of the disease.

The removal of a fragment of tissue for examination by the pathologist is commonly spok-

en of as biopsy. If a fragment could be removed without opening up fresh tissue to the immediate spread of the disease, a biopsy would be, of course, the most certain and satisfactory method of procuring a positive diagnosis. When we are dealing with lesions on the surface of the body, and especially those which have already undergone ulceration, and are, therefore, surrounded by more or less of a barrier of inflammatory tissue, this procedure may, perhaps, be justified. When we are dealing with deep tumors, however, as in cases of cancer of the breast, cutting into a tumor for the removal of a fragment for diagnosis, and closing the wound to wait perhaps for a period of seven to ten days for the report of the pathologist, virtually destroys the patient's chance that the disease may ultimately be eradicated. In my own experience, where this has been done in cases of cancer of the breast, I have never seen a subsequent operation for the radical cure of the disease result successfully, and in the experience of many other surgeons this method has been followed by almost as uniformly bad results.

The question, therefore, comes as to how we can obtain the pathological specimen that we want for diagnosis without running the risk of spreading the disease. I believe that our safest method is the employment of the cautery to excise a fragment of tissue suspected of malignancy. We thus seal up at once the lymph spaces and blood vessels, and protect the patient from the artificial spread of the disease. The fragment thus obtained can be examined immediately for frozen section diagnosis and further procedure can be based upon the pathologist's report. If the disease is malignant the radical operation is performed at once: if the disease is non-malignant the cauterized tissues can be cleanly excised with the knife, and the wound closed exactly as if the cautery had never been employed. In my opinion the cautery knife is the safest method of removing tissue for examination, and one that I believe should be much more widely employed. *No cutting into cancer tissue with either knife or cautery, however, is to be advised if the diagnosis can possibly be established, by the clinical symptoms, beyond reasonable doubt.*

When it comes to the early diagnosis of actual cancer the disease must be considered in each of its locations, and the differential diag-

nosis of the disease in that situation must be carefully worked out. The various non-malignant lesions which may resemble cancer in one situation, as the lip, differ materially from the lesions which may be mistaken for cancer in some other situation, as the uterus or the breast. In each situation, however, cases are bound to arise in which the best efforts of the physician fail to establish a positive diagnosis. How is this difficulty to be surmounted? There is no single or universal answer to this question, because of the protean character of cancer in its different situations. For each organ or situation a method of procedure must be evolved which shall safeguard the patient's possibility of cure of the disease while permitting a positive diagnosis, and, if necessary, the appropriate radical operation. Two years ago, when the subject of exploratory operations in cancer was under general discussion, I published a report upon this subject\* based upon the replies received from one hundred and thirty-four physicians and surgeons, members of the American Surgical Association, the Clinical Surgical Society, the American Gynaecological Association, and the American Association for Cancer Research. There was some diversity of opinion, and some surgeons were frankly and positively opposed to the exploratory incision into cancer tissue under any circumstances. The majority view, however, was that exploratory operation was occasionally necessary, and that when necessary it should be performed in such a way as to endanger as little as possible the patient's chance of subsequent radical cure. As a result of this expression of opinion the appropriate procedure for each situation was determined, and since that time many of us have attempted to follow closely the suggestions thereby laid down. After two years' trial of these suggestions it is my belief that the procedure may be somewhat simplified. There are three main groups of cases of cancer, in each of which a different method of procedure appears to be appropriate when the positive diagnosis of cancer cannot be established by clinical symptoms alone. These groups are as follows:

GROUP 1. Small superficial ulcerated lesions of the skin and marginal mucous membranes. In such cases the clean excision of the whole lesion by a wide margin, *immediate frozen sec-*

\*"The Handling of Early and Doubtful Cases of Cancer," by R. B. Greenough, M.D. *Annals of Surgery*, October, 1917.

tion diagnosis, and the *immediate* completion of the radical operation if cancer is present, is the method to be pursued.

A man of fifty-six presents himself with an indurated shallow ulceration, one-quarter inch in diameter, on the margin of the tongue, of six weeks duration. He gives a history of syphilis. There is a jagged tooth projecting from the lower jaw opposite to this ulceration. There is slight enlargement of a lymph node in the submaxillary region of the affected side. In such a case the differential diagnosis demands that we consider syphilis, tuberculosis, simple ulcer, and carcinoma. A Wassermann is found to be negative. There is no evidence of tuberculosis elsewhere in the body. What procedure shall we recommend in such a case? Syphilis, even if shown to be present, does not rule out the possibility of cancer, for syphilis is a frequent background for the development of cancer in the mouth. We cannot wait with safety for the so-called "therapeutic" test. The absence of tuberculosis elsewhere and the relatively slight glandular involvement make tuberculosis an extremely improbable diagnosis. The presence of the jagged tooth may account for the beginning of the ulceration, but we have learned to dread the development of malignant disease in such an ulceration, and the delay would be unsafe if we relied upon a diagnosis of a benign lesion and waited for it to heal after removal of the jagged tooth. If cancer of the tongue exists it is in a relatively early stage. I have no hesitation, therefore, in advising that this situation should be met by the operative removal, through the mouth, of the affected portion of the tongue. A margin of about three-quarters of an inch about the induration should be taken out, and the defect of the tongue closed by drawing the remaining surfaces together. This tissue can then be subjected to immediate pathological examination by frozen section, a positive diagnosis established, and the radical operation, if shown to be necessary, performed at one sitting. The two-stage operation is commonly advised by some surgeons in cases of cancer of the tongue and mouth, on account of the serious danger of infection of the mediastinum in the one-stage operation. In general, however, the complete radical operation should all be done at one sitting if possible. If the diagnosis proves not to be cancer but syphilis, tuberculosis, or simply a chronic ulcer, the radi-

cal removal of the lesion from the tongue is altogether justified by the immediate cure of the disease and the removal of the danger of subsequent malignant change.

The forms of cancer which fall into Group 1 are as follows: Early and small doubtful lesions which are suspicious of cancer of the lip, the tongue and mouth, the external skin, the vulva and vagina, the uterus and the rectum. In all of these situations I believe an exploratory excision is permissible in a doubtful case, provided it is done with all the resources for a frozen section diagnosis available, and with the understanding that the radical operation is to be completed at once if the pathological report confirms the suspicion of cancer. It will be seen that dependence is placed upon the fact that the early and doubtful case is one with only a small local lesion, and lacking the characteristic symptoms of malignant growth, such as local infiltration and fixation, and extension to regional lymph nodes. Where the local lesion is larger the diagnosis is not, as a rule, uncertain. In such cases, however, occasionally doubt will exist, and if an exploration is required reliance must be placed upon the barrier of inflammatory tissue about the ulceration: some of the central portion of the ulcer should be removed with the actual cautery. The "growing edge" of the ulceration, however, should never be cut across, lest the rapid dissemination of cancer cells defeat the purpose of the operation.

GROUP 2. Exploratory operation in cases of Group 2 is attended by more difficulty and greater risk than in Group 1. Group 2 includes deeply situated tumors, such as cancer of the breast, and many varieties of sarcoma, including sarcoma of bone. It is in these deeply situated tumors, especially, that danger of local contamination of the wound by incision into suspected tissue exists. In such cases the cautery is our best resource. An illustrative case is as follows.

Nine months after delivery, and three months after weaning the child, a woman of twenty-seven presents herself with the following conditions. The breast is somewhat smaller than on the unaffected side: there is a mass in the upper outer quadrant, stony hard, adherent to the skin, and with dilated blood vessels above it; the nipple is retracted, and there is enlargement of the axillary glands. There is no pain or tenderness in the tumor or in the glands. These

symptoms must be considered extremely suspicious of cancer of the breast. On account of the recent history of lactation, the presence of milk in the breast on the unaffected side, and the youth of the patient, the probability of a chronic abscess of the breast was considered sufficient to justify an exploratory rather than a radical operation. This operation was performed under ether, as follows: An incision with the knife was made through the skin and subcutaneous tissues above the tumor, and running toward the axilla. The margins of this incision were held apart, and the breast tissue was divided in a line radiating from the nipple, with the electric cautery. After traversing a half inch of normal breast tissue dense scar tissue was encountered, which resembled, closely, carcinoma. A fragment of this tissue was removed with the cautery, but immediate frozen section diagnosis showed no evidence of malignancy. Further exploration with the cautery then opened a cavity containing about two drachms of thick pus. A diagnosis of chronic abscess was thus established, and the possibility of malignant disease ruled out. The cautery was then abandoned; the affected quadrant of the breast, including all of the cauterized tissue and the abscess, was excised in a triangular piece, coming to a point at the nipple. The clean edges of this wound in the breast tissue were lightly sutured with catgut, a drain was placed beneath the breast, and the incision was closed. By this means the functional value of the breast for a future lactation was preserved, and, yet, if cancer had been disclosed by the exploration the radical operation could have been immediately done without fear of local contamination of the wound.

When dealing with sarcoma and other deep lying tumors which can only be exposed by the dissection of several layers of normal tissue above the tumor, the use of the cautery, as in the case of chronic abscess of the breast, is our best protection. Tissue can be excised and removed for examination with the cautery with a minimum of danger of spread of the disease. In any case, however, the completion of the operation under one anaesthesia is much to be preferred to the delay and danger attending a two-stage operation.

GROUP 3. This group of cases includes the suspicious tumors of organs in which exploratory incision into the tissue is unnecessary be-

cause the operation for cancer and the operation for the cure of any of the lesions which may be mistaken for cancer is practically the same—namely: removal of the whole organ.

In this class of cases fall cancer of the stomach and intestine, gall bladder, the kidney, the prostate, ovary and testicle. An illustrative case is that of a patient of fifty presenting symptoms of long standing ulcer of the stomach. X-ray examination shows a constant defect with loss of mobility at the pylorus, and a moderate degree of stasis. An exploratory operation reveals a mass the size of a golf ball at the pylorus, with dilatation of the stomach. There is slight enlargement of the lymph nodes in the region of the pylorus but no evidence of disease in the liver. The clinical diagnosis between cancer and ulcer of the stomach, even at operation, is recognized to be extremely difficult. The best operative treatment in such a case is, undoubtedly, a pylorotomy. By this operation the patient stands a chance for radical cure of the disease if it is cancer. If not, he is cured of his gastric ulcer and relieved of the danger of its subsequent malignant change. Even tumors of the testicle justify, I think, this radical treatment, although we recognize that syphilis is one of the conditions with which testicular tumors may be confused.

During the past ten years the view has been gaining ground that chronic irritation is an element of serious importance in the etiology of cancer. This has long been recognized in certain situations, as, for instance, when cancer finally develops in the margin of a chronic ulcer of the leg or at the situation of a long standing ulceration in the mouth. Of late, however, this predisposition of chronically irritated or ulcerated surfaces to become malignant has been recognized more widely, and a certain number of lesions, in themselves essentially benign, are spoken of as "pre-cancerous" diseases. In this category fall the pigmented moles, keratoses, leukoplakia, chronic fissures and ulceration of the marginal mucous membranes, erosions and lacerations of the cervix, the involution changes of the breast, uterus and prostate, and many benign tumors, both of epithelial and connective tissue origin, which show a disposition to malignant change with advancing years. To this group of diseases real prophylactic treatment against the occurrence of cancer can be applied. The removal of these minor lesions, often under

local anaesthesia, relieves the patient of the danger of malignant change at some future period of time. The destruction of these lesions even by radium and x-ray, if it is complete, is often sufficient to cure the lesion and to remove the danger of subsequent malignancy. In general, however, operative removal is to be preferred to radiation for two reasons: First, the complete removal or destruction of the diseased tissue must be accomplished, and this is procured with greater certainty by operation than when radiation is employed. Anything less than destruction, and anything remotely approaching additional irritation is strenuously to be avoided lest the tendency to malignant change be hastened by the increased activity of growth, which in certain cases appears to follow the incomplete destruction of tissue by radiation. In the second place, removal of the suspected area of the "pre-cancerous" lesion by operation makes possible the pathological examination of the tissue removed, and thus provides a safeguard in confirming or checking up the correctness of the original diagnosis and provides opportunity for performing at once the more extensive radical operation in case the disease is shown to have progressed already from the "pre-cancerous" to the cancer stage. In this connection the institution of a free diagnosis service is a measure of the greatest usefulness. Such a service has now been in operation in Massachusetts for nearly two years, and the specimens coming in at present at the rate of one hundred or more a month, serve to indicate how much appreciated such a service may be even in a community well supplied with hospitals and pathological laboratories. It is probable that the local excision of the lesions which are recognized to be of "pre-cancerous" significance is one of the most effective measures at present available to combat the widespread and increasing incidence of cancer.

To sum up, briefly, the essential points of this communication I would state the facts as follows:

1. The radical operation for the cure of cancer must be performed at an earlier stage than at present if material improvement in the results is to be attained.

2. The diagnosis of early cases of cancer cannot always be made by the typical clinical symptoms, and must be, to some extent, depend-

ent upon exploratory operation and immediate frozen section pathological examination of the tissue.

3. The removal of tissue for pathological diagnosis must be done in such a way as not to cause local implantation or spread of the disease and thus imperil the patient's chances of cure by radical operation.

4. Operations for the radical cure of cancer in different situations have been standardized.

5. Operations for exploration of suspicious but doubtful cases of cancer in different situations may also be standardized.

6. For this purpose three groups of cases may be recognized.

7. Group 1. Small and early ulcerative lesions of the skin and superficial tissues and the marginal mucous membranes: Lip, tongue, mouth, vulva, vagina, uterus and rectum. Such lesions should be excised with a broad margin of healthy tissue and subjected at once to frozen section examination. If cancer is demonstrated, the radical operation should be completed at once under the same anaesthesia. In doubtful lesions, which are large and ulcerated, a fragment may be removed with the electric cautery from the central portion of the lesion, but this measure should be employed only when absolutely necessary.

8. Group 2. Carcinoma of breast, sarcoma and carcinoma and other non-ulcerative malignant tumors of the deeper tissues. The cautery should be used in preference to the knife for exploration and for excision of tissue for immediate pathological examination. The radical operation should be performed at once, under the same anaesthesia, if cancer is found to be present. Delay in waiting seven to ten days for a pathologist's report is likely to be fatal to the patient's chances for a radical cure.

9. Group 3. Carcinoma of the stomach, colon, gall bladder, kidney, prostate, ovary and testicle. In these situations no exploratory incision into cancer tissue is necessary or advisable. The radical operation will be performed in any case.

10. "Pre-cancerous" lesions, not yet showing evidence of malignancy, should be removed by the knife in preference to radiation or the cautery, and the tissues should be subjected to pathological examination.

## TORSION OF THE SPERMATIC CORD.

BY HOWARD M. CLUTE, M.D., BOSTON.

ACUTE and recurring torsion of the spermatic cord with resulting infarction or gangrene of the testis has not attracted much attention. Although the condition is of relatively rare occurrence, it is quite possible that if it were more often considered in the diagnosis of affections of the testis, more cases would find their way into the literature.

Torsion of the cord occurs most frequently in young men. Of fifty-three cases in the literature, the average age was 19. Seventy-seven per cent. were in men of 25 or under, and 47% of the total occurred between the ages of 15 and 25. Taylor<sup>2</sup> reports a case occurring in a child four hours after birth and Nicoladini,<sup>3</sup> one in a man of 62.

The right testis is affected somewhat more frequently than the left. Of fifty-seven cases in the literature, thirty-four were of the right and twenty-three of the left testis. In thirty of these fifty-seven cases, the testis was incompletely descended. Of these thirty, however, four were entirely intra-abdominal, so that from these figures it would appear that torsion in the fully descended testis occurs practically as often as in the partially descended testis.

The presence of hernia accompanying the twisted testis was mentioned in but four cases, in three of which the testis was in the inguinal canal. In view of the fact that we now know that a hernia accompanies practically all undescended testes, we must conclude that the presence of hernia was omitted from the case reports of the undescended cases or was overlooked in the presence of the more acute lesion, torsion.

The chief predisposing cause for torsion of the spermatic cord is a developmental abnormality in the attachment of the cord to the epididymis and testis. In a normally attached testis the common mesentery is formed by the reflection of the parietal layer of the tunica vaginalis onto the epididymis and testis. The upper limit of this mesentery is the center of the globus major, while the lower limit is the lower pole of the testis or the tip of the globus minor. In cases of torsion of the cord, however, this common mesentery is attached to but a small portion of the epididymis, usually the globus major; and the remainder of the

testis and epididymis lie free in the tunica vaginalis. The condition has been compared, by various writers, to fruit hanging by the stalk. Rigby and Howard.<sup>9</sup> Dowden,<sup>13</sup> Scudder,<sup>8</sup> and others report cases of torsion in all of which this abnormality of attachment was present.

An abnormally loose serotum and a voluminous tunica vaginalis have also been thought to be predisposing factors for torsion of the cord.

Murray<sup>10</sup> believes that torsion of the testis is always of congenital origin; that some degree of rotation occurs during the passage of the testis from kidney to serotum, which later results in thrombosis with any sudden vascular changes in the cord. If such were the chief predisposing factors, however, it seems probable that torsion of the cord would be of far more common occurrence.

The exciting cause of torsion of the cord is not known. In many cases there is a history of the performance of some unusual labor shortly before the onset; and this has been held by many writers to be an important factor. In several cases, however, the onset had come while the patient was asleep and in others just as he was arising. In a few cases there was a history of antecedent injury to the testis. No single factor appeared to precede the onset in every case or to be in any way related to it.

The pathological findings in a case of torsion of the cord will vary with both the duration and the completeness of the twist. In any case the tissue of the serotum will be more or less tense and edematous. The tunica generally contains a small amount of fluid. In an early acute case this fluid is straw colored but in older cases of complete torsion it is blood stained and the color of prune juice. The testis and epididymis below the twist are of bluish black color, like that of a piece of strangulated gut. In none of my cases was there any noticeable change of color after the application of hot towels and detorsion. Dowden<sup>13</sup> reports cases of partial torsion operated early in which this was seen. In each of my cases the testis was freely movable in the tunica vaginalis, but no abnormal laxity of this sac was observed. The twist of the cord is always intratunical, between its attachment to the testis and the reflection from it of the tunica vaginalis. Taylor's case<sup>2</sup> is the only exception to this found in the literature. Because of the vague terms used in describing the torsion, it is difficult to tell exactly the direction usually followed. In my

cases, however, the twist was from within, outward and forward and this is apparently the more usual direction. The twist may, however, be in either direction<sup>12</sup>. The number of turns of the cord varies from one-half to five<sup>13</sup>, the former being rather more frequent. Marked anemia of the structures of the cord is found at the point of the twist. Below the twist, the vessels are thrombosed and there is total infarction of all the tissues. Howard<sup>12</sup> reports that one of his specimens showed no trace of normal tissue but resembled a blood clot when sectioned. Above the twist, marked congestion of the vessels is found. Hemorrhage into the tissues of the cord may be present. The congested tissues of the cord show a tendency to be in a long spiral as they descend, doubtless being dragged somewhat by the tunica vaginalis, which would tend to twist with its contents. This appearance of the cord may give the impression that the twist is located in the inguinal canal rather than in the tunica.

In all of my cases, the cord was abnormally attached. In Case 1, the entire globus major and also the globus minor were free, the cord being attached only over the body of the epididymis for a distance of about 2 cm. In Case 2 the cord was attached over a relatively smaller area situated at the globus major. The body of the epididymis and the globus minor were free. In Case 3, inversion of the testis in addition to an abnormal attachment of the cord was found. The globus major lay at the lower pole of the testis, the body of the epididymis in front of the testis and the globus minor at the upper pole of the testis. The spermatic cord here descended into the tunica vaginalis and was attached to the globus major and the body of the epididymis. The vas deferens descended in the cord and then turned sharply upwards and passed along the body of the epididymis to the globus minor at the upper pole of the testis.

Clinically, we may recognize two general types of torsion cases,—acute complete torsion of the cord and acute partial torsion of the cord. The latter condition is prone to be recurrent. The symptoms of the two types differ only in the degree of their severity and duration.

In acute complete torsion of the cord, the onset is very sudden with severe pain in the testis. This pain often radiates along the inguinal canal and may radiate down the thigh or into the pel-

vis. Vomiting often occurs at the onset, but does not persist. More or less shock and prostration is present at first. Fever does not occur early but one or two degrees may be present later in the course of the condition. The testis is tender soon after the onset. After twelve or eighteen hours the scrotum becomes slightly red-hot, swollen and very tender on the affected side. Edema of the skin was present in two of the writer's cases. The epididymis may be palpated in front of the testis, especially if the case is seen early. In cases seen several days after the onset, the relations of testis and epididymis cannot be defined because of their swelling and the presence of some degree of hydrocele. The spermatic cord in the inguinal canal is neither enlarged nor tender save near the point of torsion. The prostate and vesicles are negative to rectal examination.

In partial torsion of the cord the symptoms are similar but less severe. Recurrent attacks of pain occur in the testis, followed by slight swelling of the scrotum. The pain is often mild and of a relatively short duration. Vomiting and fever are unusual.

In any case after detorsion, the symptoms disappear as quickly as they arise. Untreated, the pain, tenderness, and swelling persist for many days. Recurrences are common in untreated cases. Murray<sup>10</sup>, Attlee<sup>14</sup>, Corner<sup>15</sup>, Howard<sup>12</sup>, and others report atrophy of the testis after one or more attacks of torsion.

The diagnosis of torsion of the spermatic cord should not be difficult. Acute gonorrheal epididymo-orchitis has a history of preceding urethral discharge, ceasing with the swelling of the testis. The systemic reaction is more marked, there generally being several degrees of fever present. Rectal examination and a urinary examination will generally show the presence of chronic prostatitis and vesiculitis.

A strangulated indirect inguinal hernia may closely resemble torsion of an undescended testis. The absence of the testis from the scrotum on the affected side and the history of its presence in the canal should suggest the possibility of torsion of the cord rather than hernia. Vomiting, obstipation, and distention are not generally seen with torsion of the cord. The symptoms of torsion of the cord tend to improve in a week or less, while those of strangulation grow steadily worse.



The prognosis in torsion of the cord is excellent. No fatal case was found in the literature. Atrophy of the testis is a very probable outcome whatever treatment is employed.

The treatment of torsion of the cord depends on whether or not the testis is fully descended and on the duration of the torsion.

In any case seen shortly after the onset of the symptoms, detorsion should be attempted. Since the usual direction of the twist is from within outward and forward, the reverse should first be attempted. Increasing pain demands that an attempt to turn the testis in the other direction be made. Dowden<sup>12</sup> reports that successful detorsion is marked by a peculiar shucking sensation and the immediate relief of the pain in the testis. Prag<sup>16</sup>, Dowden<sup>15</sup>, Attlee<sup>14</sup>, Williams<sup>17</sup>, and others report torsion cases relieved at once by detorsion. Some patients learn to untwist the testis themselves, if occasion arises.

If detorsion cannot be done, an operation is necessary. In fully descended testes, an incision is made in the scrotum and the tunica vaginalis opened. An attempt is made to untwist the cord and to restore the circulation to the testis by the application of hot towels. If the case is not seen early, this attempt will fail. Orchidectomy should then be performed.

If the circulation returns, even in part, Dowden<sup>13</sup> recommends the following plastic operation which he has used several times successfully. The entire parietal layer of the tunica vaginalis is removed. The visceral layer of the tunica over testis and epididymis is scarified. The testis is sutured to the scrotum with one or two catgut stitches through the tunica albuginea.

It seems feasible in these cases not to remove all the parietal layer of the tunica but to leave a portion of it posterior to the testis. Suturing this as well as the testis to the scrotum should hold the testis much more firmly. No opportunity, however, has yet arisen for this to be tried, for all cases here reported demanded orchidectomy.

The best treatment for torsion of an undescended testicle is orchidectomy. If, for any reason, this cannot be done, a plastic operation returning the testis to the scrotum, if possible, and at least fixing it to prevent future twists, is indicated.

In recurrent partial torsions, Dowden's operation described above is indicated.

If no operative interference is allowed, expectant treatment with rest, scrotal support and an ice bag is a temporary relief to the patient.

#### CASE REPORTS.

**CASE I.** From the Fourth Surgical Service, Boston City Hospital, by courtesy of Dr. Paul Thorndike.

A healthy man aged 27. Married. One child living and well. Admits gonorrhoea 7 years ago, lasting about 4 months, with no known complications. No urethral discharge since that time.

At irregular intervals for some years has had attacks of pain in right scrotum lasting a short time and then disappearing. Noticed scrotum was usually slightly swollen for a few days after each attack.

Ten days before admission, while shoveling wet sand, was seized with very severe pain in right scrotum radiating into inguinal canal and down right thigh. No vomiting. Bowels regular. No urinary difficulty. No urethral discharge. No known fever. On the following day, the right side of scrotum was red, swollen, hot, and very tender. Was treated with ice bags and scrotal support, with some improvement, but tenderness and swelling persisted and patient was unable to work.

On admission the general physical examination was not remarkable. The right scrotum was swollen, red, and hot. The skin was edematous. Testis and epididymis could not be distinguished but were markedly larger than on the left. The cord was slightly tender and enlarged up to the external ring. There was no impulse with coughing. The prostate and vesicles were apparently normal to rectal examination. The urine was negative. There was no fever and the pulse was not accelerated.

**Operation.** Dr. H. M. Clute, by courtesy Dr. Thorndike.

A  $2\frac{1}{2}$ " incision made along scrotum. Tissues tense and edematous. Tunica opened with escape of a few drachms of sero-sanguinous fluid. Epididymis presented in front. Testis and epididymis of dark purple color. Testis hung from cord like fruit on stalk. A half twist of the cord from within outward and forward found just inside the tunica vaginalis. The circulation failing to return after detorsion, orchidectomy was performed.

The patient made an uneventful recovery.

CASE 2. From the Third Surgical Service, Boston City Hospital, by courtesy of Dr. E. H. Nichols.

The patient, a healthy boy aged 18. Never sick before. Absolutely denies all venereal disease. Five days ago, while walking to work in the early morning was seized with severe pain in the right scrotum, radiating into the inguinal canal. On the following day, the right side of the scrotum became red, hot, swollen, and tender. There was no known fever. No vomiting. Bowels moved daily. The pain was somewhat relieved by ice bags but the swelling and tenderness persisted.

On admission the general physical examination was negative. The right side of the scrotum was swollen, red, hot, and very tender, especially at the upper portion. The skin was edematous. The testis was swollen to about twice the size of the left one and it was thought that the epididymis could be palpated in front of the testis. There was no urethral discharge. The prostate and vesicles were negative.

A diagnosis of torsion was made and detorsion was attempted without success.

*Operation.* Dr. E. H. Nichols.

An incision made from external ring well down the scrotum. The tissues were edematous, and above the tunica vaginalis the tissue of the cord descended in a long spiral. The tunica was opened with the escape of a few drachms of dark blood-stained serum. The attachment of the cord to the testis was at the globus major and was so limited that it was no more than 5 cm. diameter. The testis and epididymis were somewhat swollen and of blue black color. There was a half twist of the cord, intratunical, from within outward and forward, which was untwisted, with no return of circulation. The testis was then removed.

The patient made an uneventful recovery.

CASE 3. From the Fourth Surgical Service, Boston City Hospital, by courtesy of Dr. Paul Thorndike.

Patient a healthy young man aged 21 who had never been sick before. Denies positively all venereal disease. Has had an occasional balanitis.

Six days ago, while scuffling with a friend, received a slight blow in the scrotum, which was painful for only a few minutes. Five days ago

noted "a heavy feeling" across back and down thighs while standing. Four days ago, while pulling on his shoe just after rising, was seized with very severe pain in right scrotum that ran up into the inguinal canal. After taking some milk of magnesia, patient vomited several times. The following day he noticed that the right side of his scrotum was red, hot, swollen and very tender. The pain and tenderness have persisted.

On admission the general physical examination was not remarkable. The right side of the scrotum was red, hot, tender, and swollen to about twice its normal size. The skin was edematous. A small degree of hydrocele was present. Testis and epididymis could not be differentiated by palpation. No urethral discharge. Urine negative. Prostate and seminal vesicles negative. Temperature 100 degrees F. on admission but normal ever since. Pulse normal.

A diagnosis of probable torsion of the cord was made and detorsion attempted with no results.

*Operation.* Dr. John Duff, by courtesy of Dr. Thorndike.

A 5 cm. incision in the scrotum. All layers were edematous. On opening the tunica, several drachms of dark colored serum escaped. The testis and epididymis were blue black in color. The cord was attached by a pedicle to the globus major, which lay at the lower pole of the testis—"inversion" of the testis. There were  $2\frac{1}{2}$  full turns of the cord inside the tunica just above its origin on the testis. The circulation failing to return when the cord was untwisted, the testis was removed.

The patient made an uneventful recovery.

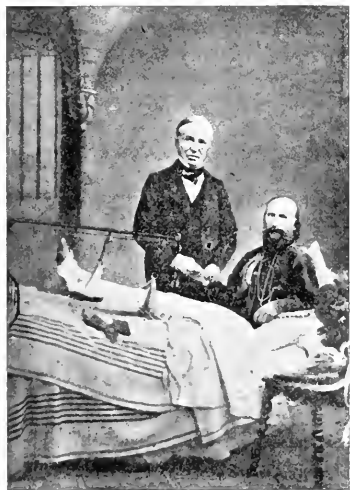
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## THE NÉLATON PROBE.\*

BY J. COLLINS WARREN, M.D., BOSTON.

DR. WARREN called attention to a photograph of Nélaton and Garibaldi which formed part of a collection recently presented to the Society. The photograph in question shows Nélaton at the bedside of Garibaldi at Spezzia on October 28, 1862, and it is interesting from the circumstance that the visit gave rise to the invention of what has since been known as "Nélaton's probe," an instrument devised for discovering the presence of a bullet in a wound, and well known to surgery for the last half century.



GARIBALDI AND NÉLATON.

Garibaldi was wounded at Aspromonte on August 29, 1862. Besides two superficial wounds, he sustained a wound of the right ankle bone just in front of what is known as the internal malleolus. After a treatment of several weeks by the Italian surgeons, who had not been able to make up their minds as to the proper course to be followed, Mr. Richard Partridge of London, referred to by the Dublin Press as the "champion English surgeon," at the instance of the "Garibaldi Committee" proceeded to Italy in order that the wounded man might have the judgment and skill of a British surgeon. Mr. Partridge, on making his

report to the "Garibaldi Italian Unity Committee," stated that he arrived at Spezzia on the 16th of September and had since that time daily visited the General in company with Dr. Pandina and his other medical assistants. As the result of these visits he expressed the opinion that the bullet did not enter the joint nor effect a lodgment elsewhere. For this service Mr. Partridge received a fee of six hundred and eighty pounds from the secretary of the "Garibaldi Surgical Fund."

The wound continued, however, to remain open. Dr. Ripari and his Italian colleagues still felt that the presence of the bullet was not disproved, and as signs of inflammation gave rise to the feeling that amputation might become necessary, a further consultation was decided upon for which, apparently, not only Mr. Partridge, but also the celebrated surgeons, Pirogoff of St. Petersburg and Nélaton of Paris, were sent for. It appears that Nélaton examined the patient on October 28, and on introducing an ordinary probe detected a resonant sound characteristic of an instrument striking a metallic surface, and not dull as if coming in contact with spongy bone, which left no doubt in his mind of the presence of the bullet in the wound.

Messrs. Partridge and Pirogoff, according to accounts, saw the patient three days after this; and Mr. Partridge gave out, as the result of their observations, that "as far as can be judged by external exploration the ball will be found toward the external part of the articulation fixed in the bone." They advised waiting for the ball to become mobile and near the surface, before attempting extraction.

This is of special interest as Mr. Partridge has always been accused of expressing the opinion that the ball was not in Garibaldi's foot, although at his first visit, as we have seen, he felt inclined to that opinion; at his second consultation he saw fit to change his diagnosis.

Attempts had been made by Professor Zannetti to detect the ball with an electric battery without success, but Nélaton, on his return to Paris, after consultation with a M. Emmanuel Rosseau, devised a probe topped with white porcelain which, when pressed upon a leaden substance, would receive a mark of the lead upon its surface. The probe, on its arrival, being tried by Doctors Rosseau and Zannetti, con-

\* Read at a meeting of the Massachusetts Historical Society, February, 1915.

firmed the diagnosis of the presence of the bullet, and on the twenty-third of November the following telegram was sent to Nélaton: "Ball extracted from the wound of Garibaldi as assured by your diagnosis guaranteed by the result of your probing. *Honneur à vous Torrelli.*"

"Nélaton's probe," thus made famous, was looked upon for many years afterwards as the only instrument of precision by which a bullet wound could be conclusively determined. Its usefulness has probably, if not entirely, been set aside by modern x-ray methods.

Nélaton's connection with this case was regarded at the time as a great triumph of French over English surgery and Mr. Partridge was by many regarded as having experienced a most unfortunate episode in his career. A careful analysis of the facts seems, however, to show that Mr. Partridge, although at his first visit (which was about three weeks after the injury) expressed the opinion that there might be no foreign body in the wound, was able to come to a different conclusion a month later, and had therefore agreed with the other surgeons as to the presence of a bullet in the wound.

It may be said here that the wound healed slowly, after the removal of the ball, for we find at the time of Garibaldi's visit to England in 1864, that although his leg still continued to trouble him somewhat, his wound had been healed some four or five months.

Dr. Warren said he had had the pleasure of seeing both Mr. Partridge and Nélaton while a student abroad. They were both born early in the century, Partridge in 1805, and Nélaton in 1807, and both died within a few weeks of each other, in 1873. They were men of strikingly different characteristics. Mr. Partridge was a very old-fashioned type of an eccentric Englishman, and although he occupied at the time to which we have referred, the position of seniority in English surgery, he was never regarded by his colleagues as an exceptionally brilliant exponent of surgical art. Dr. Warren's personal experiences left a striking impression of a quaint personality and he can ascribe heartily to a statement made in Mr. Partridge's obituary notice that "he flavored his discourse with jests which were not always quite convenient."

Nélaton, on the other hand, as Dr. Warren recalls him, was a refined, well-groomed and courteous Parisian gentleman. He was the

popular surgical hero of his day, and in later years filled the office of surgeon to Napoleon III. And he soon became in high favor at court owing to his successful treatment of the young Prince Imperial. The Prince, a child about ten years of age, had been suffering from a swelling on the hip which Nélaton had pronounced an abscess. It was commonly reported that when Nélaton took up his knife to operate, Napoleon instinctively stretched out his arm. But the surgeon, murmuring gently, "Pardon, Sire," restrained the anxious and doubting father with one hand while he plunged the knife in and laid the abscess open.

Dr. Warren said that he thought the facts of this episode in the lives of these two celebrated surgeons were worth recording in connection with the accompanying illustration and, so far as he knew, no such illustration as Nélaton at the bedside of Garibaldi had hitherto been published.

## PANNICULITIS. ITS DIAGNOSIS AND TREATMENT.

BY FRANK A. CUMMINGS, M.D., PROVIDENCE, R. I.

THIS paper is presented in an attempt to clarify the diagnosis of a very common condition which has had practically no mention in any recent American literature.

Aside from a definition of panniculitis in Gould's dictionary, little or nothing has been written except a short editorial on "Panniculitis Abdominalis," which appeared in the *New York Medical Journal* March 22 of this year.

This paper is based on a short article which was translated from the Swedish and on personal observation on a series of 78 cases.

Gould's dictionary defines panniculitis as "An inflammation of the superficial layer of fat in the abdomen." This, however, is not sufficient, because the superficial layer of fat of any part of the body may be involved either as a localized area or as part of the entire body, including the upper and lower extremities.

I am also of the belief that the connective tissue in the skin is involved in the process and in some of my cases a myositis was also present.

It occurs more frequently in the female and involves larger areas in the obese patient. It is not limited, however, to the obese, as is shown in my series of cases in which 48 pa-

tients were more than 20 pounds over normal weight, 18 were 5 to 20 pounds over weight, while 3 were more than 8 pounds under weight. The condition is slowly progressive and without acute subjective symptoms.

The etiology has not been clearly worked out. The European literature refers to trauma and exposure to cold and similar excuses for etiological factors. In all of my cases I have found the predominant factor to be gastro-intestinal disturbances, such as habitual constipation, often of the spastic type. Also there can usually be found a diminished supply of oxidizing agents such as is furnished by the endocrine glands.

Neurasthenia is given as a cause by the Swedish writers, but I feel that it is a result rather than a cause and usually appears after the patient has tried various methods of treatment without relief.

The editorial on panniculitis in the *New York Medical Journal* says that histologically the disease is characterized by "sclerosis of the fatty tissues more or less hypertrophic." In the superficial fat may be felt hard, nodular masses, varying in size from a bean to a small walnut. These masses are very painful to the touch and are freely movable under the skin.

The patient usually complains of marked fatigue and loss of vitality. Headache of the migranous type is most common. The patient is often very nervous and at times depressed, and speaks of a peculiar ache or soreness in various parts of the body.

In well advanced cases there may be definite pain, and especially is this important in the abdomen, where the diagnosis may be easily confused unless a panniculitis can be recognized by the examiner. This is shown by the following case report:

In 1916 an obese female patient was seen who gave a history of headache, nausea, constipation, and, after any slight exertion, a constant pain in the upper right quadrant extending around to the right shoulder blade. The appendix had previously been removed.

On examination marked tenderness was found in the gall bladder region and x-ray plates were negative and a diagnosis of "surgical belly" with probable gall bladder disease was made. This was verified by another internist and a surgeon, and exploratory incision advised. At operation a normal gall bladder and duodenum were found and no evidence of ulcer or obstruc-

tive adhesions was noted. Two years after operation, following a few months of treatment for panniculitis, all symptoms had disappeared, and at the present time have been absent about five months.

On physical examination, these cases present three prominent signs on which the diagnosis of panniculitis may be made. They are: 1, Pain on light palpation; 2, swelling, and 3, localized oedema.

The pain may best be found by gently grasping the superficial tissue as in pinching. No pressure with the fingers is necessary. The pain produced by this method is out of all proportion to the lightness of the pressure and causes the patient to cry out, and may bring tears to the eyes.

The swelling is boggy in character and it is in these areas that the nodules are more commonly found. The consistency of the tissue shows loss of tone and elasticity and in the long standing cases there is a moderately well-marked congestion.

The treatment of panniculitis consists of massage by a well-trained Swedish graduate, that is, one who understands major and minor petrissage, and not a massur who feels that he must abuse the patient in order that he may produce results. The time of massage should be limited to frequent, short periods, because it is painful, and long treatments usually produce exhaustion. Thirty-minute periods three times a week are usually sufficient. Under medical treatment the constipation must be relieved and this is best done by high rectal injections of warm olive oil repeated every other night and by regulation of the diet.

The obese patient should be reduced to normal and the high percentage carbohydrates of the diet reduced to a minimum, while the low per cent. carbohydrates, fruit and vegetables should be increased.

Again, in many cases of poor oxidation, I have found the gland products of Burroughs & Wellcome most valuable.

To summarize, panniculitis is a common condition characterized by soreness and oedema and sclerosis of the superficial layer of fat; also on palpation, severe, sharp pain is produced by slight pressure, and nodular masses are to be found in the skin. The treatment of choice is massage, regulation of the diet and increase of elimination and oxidation. The prognosis is always good when properly treated.

## Medical Progress.

### PROGRESS OF ORTHOPEDIC SURGERY.

By C. HERMANN BUCHOLZ, M.D.; ROBERT SOUTTER, M.D., LT.-COL. ROBERT B. OSGOOD; H. C. LOW, M.D., MAJ. MURRAY S. DANFORTH, BOSTON.

(Concluded from page 211.)

#### INJURIES.

##### *Fractures of the Spine.*

It is not yet a sufficiently appreciated fact that many cases of old fracture of the spine, even without injury to the cord, suffer from prolonged and permanent disability due to the interference of the function of the spine. To relieve this disabling condition, Brackett<sup>55</sup> has performed an Albee operation in a number of these cases and the present communication which he has written in conjunction with Mixter and Wilson has as its object to determine by a comparison of operative and non-operative cases whether this operation is advisable. None of the cases considered have had symptoms of nerve injury, or at least not more than passing, and in all cases has the diagnosis been verified by an x-ray picture. Of the nine cases operated, five have had previous supportive treatment leaving all more or less disabled. The other four were operated within eight weeks from the injury. All operated cases have since returned to the same, or a similar, occupation; one of the early cases, operated on the seventeenth day, removed his support after eight weeks and returned to work three months after the injury, calling himself well. Another, operated three months after the fracture, which was followed by increasing deformity, resumed full work as a lineman six months after the operation. These cases are compared with eighteen cases of fracture of the spine without cord symptoms, which have not been operated. All of these have had, or still have, supportive treatment, but only four have returned to occupations similar to the ones they had before the accident. The others are more or less disabled and to a considerable percentage unable to do any work. The indications are given somewhat tentatively for the fresh cases: (1) abnormal mobility; (2) increasing deformity; (3) extensive fractures. The cases should not be operated within the first two or three weeks because of the danger from hemorrhage. Also, cases with symptoms of a crushed cord or an extensive nerve lesion are not suit-

able for operation. Finally, the general condition of the patient, pulmonary disease, etc., are to be taken into account. In old cases the operation is indicated if the patient is disabled by pain, either local or referred, or weakness of the back, or if the deformity increases. The technic follows the rules laid down for Albee's operation, a deep, strong graft being used, which is to reach two sound vertebrae above and below the seat of the fracture. When the fifth lumbar vertebra is broken, the lower end of the graft is split and fastened astraddle to the spinous processes of the upper sacral vertebrae. The authors conclude in saying that there is strong evidence in favor of an early operation.

##### *Rupture of the Crucial Ligaments.*

For the repair of the ruptured crucial ligaments of the knee joint, Groves<sup>56</sup> has devised an ingenious plastic operation. For the anterior ligament he uses the ilio-tibial band; for the posterior ligament, the tendon of the semitendinosus, which are pulled through holes drilled through the condyles as nearly as possible according to the normal course of the crucial ligament. He opens the joint with a wide horseshoe incision, going down to the hamstrings, and temporary resection of the tibial tubercle. In closing, the tibial tubercle is fixed by a nail of metal or ivory. The leg is placed on a back splint for about a fortnight, to be followed by gentle massage and passive movements.

Generally speaking, Smith<sup>57</sup> says, the immediate treatment of injuries to crucial ligaments should be conservative rather than operative. Recent injuries to the joint that show abnormal mobility should be roentgenographed as a routine. This will eliminate avulsion of the tibial spine. Where there is rupture of both crucials, due to lateral or posterior dislocation of the knee, the limb should be immobilized with the knee flexed to 20 degrees for at least three months, but faradism to the quadriceps and general massage with movements of the patella should be practised daily. Good results have been reported from treatment by prolonged fixation of the joint. When the lesion is accompanied by a paralysis of one or both of the popliteal nerves due to stretching, postural and electrical treatment for the nerve injury must also be undertaken. Where there is a recent avulsion of the tibial spine, Smith advises to try the effect of immobilization of the knee in the fully extended position for twelve weeks,

combined with massage and faradism, rather than to treat the cases by primary operation and fixation of the detached ligament and its insertion. In cases of old standing, however, operative measures are indicated. The after-treatment of anterior crucial injuries can generally be undertaken by means of appliances worn for an indefinite period.

In the operative treatment of anterior crucial injuries, the following operations have been done at varying times, apart from those of immediate suture of the ligaments: (1) plication; (2) reefing; (3) wire loops; (4) silk ligaments substitution; (5) fascial substitution. Smith's experience with these operations leads him to endorse only fascial substitution.

[Ed. Note—We should object strongly against the advice to immobilize the knee joint in fully extended position for twelve weeks, as in our experience such a measure is apt to lead to stiffness of the knee and will probably disable the patient more than insufficiently healed crucial ligaments ever would. We are rather inclined in early cases to combine fixation in semiflexion with massage and gentle, assisted active-passive motions; and to operate if the knee heals with definite symptoms of tearing, chiefly instability.]

#### *Fractures of the Os Calcis.*

The first and most essential procedure in the treatment of fractures of the os calcis in the opinion of Magnuson<sup>58</sup> is the tenotomy of the Achilles tendon. This will relieve the pulling up of the short posterior fragment and prepare the second step which consists in the restoration of the longitudinal arch by forcible manipulation over a block. A plaster cast is applied in fully corrected position for several weeks, followed later by adhesive plaster strapping with felt pads.

#### *Retarded Development of Wrist Bones.*

Some time ago, in studying the x-ray pictures of wrists of children, the late pediatricist Rotch came to the conclusion that retarded development of bones is shown very clearly in the wrist joint and called attention to the danger of strains in such cases. Barry<sup>59</sup> has taken up again these ideas and reports three cases of children with traumatic arthritis and epiphysitis which he explains chiefly by retarded ossification. Anatomically such children are too young to be subjected to the ordinary strains of their age.

#### CONGENITAL ABNORMALITIES.

##### *Spina Bifida.*

Briekner<sup>60</sup> records a number of interesting histories with operative findings of cases of spina bifida occulta which he divides in four groups: (1) cases with external signs with symptoms such as trophic disturbances, anaesthesia, etc.; (2) with external signs without symptoms; (3) without external signs with symptoms; (4) without external signs without symptoms. Of special interest has been the observation of growth of callus as a purely trophic phenomenon independent of pressure and the prostration and marked rise of temperature which preceded and accompanied the outbreak of an ulceration. Briekner comes to the conclusion that the results of operation for spina bifida occulta are not brilliant, probably for the reason that the degeneration and neoplastic processes are scarcely remediable. Those cases in which there is a hernia of the spinal root probably offer the best chance for a good result; for the reduction of this hernia into the bony canal, by relieving the contained nerve roots of traction and pressure, may greatly improve the existing symptoms or prevent the development of some others. Even when there is no meningocele, much may be found possible at the operation; for example, separation of adherent nerve roots from the membrana reuniens, division of a connecting band, removal of an endostosis, or perhaps even the removal of the cauda equina.

Briekner considers the following as legitimate indications for operation: (1) in infants and children with congenital lipoma or hypertrichosis, even though without symptoms as a preventive measure; (2) in adults with sufficient serious and especially progressive symptoms, whether or not it is marked by external signs. Such symptoms would be progressive gangrene of the lower extremities or incontinence of the sphincters. Briekner has found in the literature 12 operated cases to which he adds 5—all of the 17 without mortality and some with decided benefit.

#### POSTURE.

The observation of a patient who was relieved from eye strain by postural treatment induced Lowman<sup>61</sup> to investigate the relationship of these conditions. Searching the literature he found no references and only a few along the reversed lines. Dr. Mills, an ophthalmologist who worked in coöperation with the author,

noticed a marked muscular imbalance, especially an abnormally strong divergence to exist much more frequently in cases of faulty skeletal alignments than in normal persons. Lowman describes in detail the anatomy of the cervical ganglia, their connection with the eye and ear, and their relation to the spinal and cervical muscles; also the close relations between muscular activity, posture, and balance to the organs of sense, especially the eyes, which have a controlling influence. From such deductions it would seem only logical to explain the striking results which were seen in cases of marked eye strain by postural treatment.

[Ed. Note.—The editors wish to comment on the splendid work revealed in this article, and agree with the author that his observations open a wide field for further research.]

#### *Back Pain Caused by Uterine Displacements.*

The much disputed question whether and to what extent gynecological disturbances are responsible for backache has been approached by Graves<sup>62</sup> in a rational way by statistics of 500 cases with retroversion and retroflexion. Low back pain, chiefly sacral, was complained in 76%. All cases have been operated and letters were sent out to them after some interval; 263 patients answered and 86% of these were either completely cured or greatly relieved from back ache. The unrelieved cases were re-examined and either proved to be a failure, or another cause, mostly of an orthopedic nature, was found. The conclusion was drawn that a definite relationship existed between retroversion and backache. However, as many of these 500 cases were complicated with pelvic inflammations, another series of 100 cases of retroversion or retroflexion without pelvic inflammation was started; of these cases 60% complained of backache and 95% were cured or relieved. It appears, therefore, that an inflammatory process intensifies the back pain, but that malposition is the chief factor. Inflammations or tumors which fix the uterus in anteversion usually cause no backache. A partial prolapse, especially of the retroflexed uterus, is more likely to cause pain than a total prolapse. It seems that the retroflexion represents the important element. Uterine backache is confined to the sacral, or very low lumbar region. The source of this pain lies at the junction of the body of the uterus and the cervix. Antelexion may cause backache, especially during menstruation,

which is generally dysmenorrhœic. Pain in such cases is explained by developmental relaxation of the uterus, which is in a certain retro-displacement. Many of these cases are connected with lateral curvature, weak back, or viscer-optosis.

#### *Distorsion of Pelvis.*

Merrill<sup>63</sup> has made careful clinical and radiologic studies of the distorsion of the pelvis from postural defects. Where weight, *e.g.*, is habitually borne on the right leg, the abductor muscles are relaxed, the pelvis tilts to the left, the left knee is flexed, and a left lumbar scoliosis with increased lordosis results. This apparently leads to an increased action of the left long posterior muscles and a stress is so applied to the pelvis that the left ilium is flattened and torsed on its long axis: that is, the ilium is rotated to the left. The constant stress on the left ilium produces a distinct and sometimes very marked bony hypertrophy along the insertion of those muscles. The two ossa innominate are rotated in opposite directions and from this rotation results a relative elevation of the left anterior superior spine. The usual way of measuring the length of the legs from the anterior superior spine is insufficient in such cases. To be exact, five measurements should be taken from, (1) the tuberculum pubicum; (2) the anterior superior spine; (3) the crest of the ilium; (4) the tip of the trochanter; and (5) the posterior superior spine.

As a reliable non-slipping support of the sacro-iliac joint, Owen<sup>64</sup> has devised a low corset with double spica extension. It is laced in front of the abdomen and the thighs and a reinforcing belt is applied between the crest and the trochanters. In the discussion objection against the front lacing is raised.

[Ed. Note.—The editors agree with this objection, believing that no proper support can be expected except by a firm hold on the back.]

#### FEET.

A study of the anatomical variations of the foot has convinced Painter<sup>65</sup> that they are a frequent cause of hallux-rigidus by bringing up an unequal position of the first metatarsophalangeal joint in the shoe. Thereby a constant traumatism is caused leading to bony proliferations on the dorsum of the head of the first metatarsal bone. Further support is lent to this theory by the unilateral occurrence in



such cases. The treatment in early cases consists in prescribing a custom made shoe or wearing for six months a plate with a steel tongue under the big toe. In advanced cases excision of the exostoses is the method of choice.

Hallux valgus is caused, in Painter's<sup>66</sup> opinion, by two factors: pointed shoes and obliterated anterior arch. He thinks that the old Hueter's operation is sufficient for all cases which are beyond non-operative repair; but it is absolutely necessary to take care to keep the toe in good position until a symmetrical shrinking of the capsule has taken place. Painter uses a small splint sterilized and applied right after the operation: "The proximal end of the phalanx is prevented from riding up by an arm that exerts pressure on it from above at the same time that a flange makes pressure against the outer side of the first phalanx of the great toe in such a direction as to keep the toe in a straight line with the axis of the shaft of the metatarsal."

[Ed. Note.—The editors believe that the most frequent cause of hallux rigidus is short shoes.

We also believe that the Keller operation for hallux valgus is generally superior to the Hueter. There is no question but that the removal of the metatarsal head sacrifices an important weight-bearing pillar. This may be largely compensated by a plate, but in young and active patients the removal of the head of the bone often materially restricts their activities. With standing occupations, e.g., in nurses and in military life, the Hueter operation should rarely be performed.]

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## American Medical Biographies.

REID, WILLIAM W. (1799-1866).\*

WILLIAM W. REID of Rochester, New York, was the first to show the futility of trying to reduce dorsal dislocation of the hip by forcible longitudinal traction by pulleys, and he gave a partial explanation why the English method then in vogue was not correct. He deserves the gratitude of the world for perfecting the comparatively painless and the efficient method of reduction now in use.

The known facts of his life are few, due in part to the loss by fire of the records of the Monroe County Medical Society. He was born in Argyle, Washington County, New York State, in 1799, and entered Union College from that town April 26, 1823, graduating A.B., with Phi Beta Kappa honors, July 27, 1825. He began the study of medicine under Dr. A. G. Smith of Rochester, and Reid says he was there in 1826, '27, and '28; but where he took his M.D. degree has eluded the careful search of many investigators. That he had an M.D. is plain, for it was signed to his published articles and as he was president of the Monroe County

\* From the forthcoming "American Medical Biography," by Dr. Howard A. Kelly and Dr. Walter L. Burrage. Any important additions or corrections will be welcomed by the authors.

Medical Society in 1836, '37 and '49, he was in good standing and at the same time regarded with favor by his associates. His writings prove him to have been an original, inventive and bold surgeon. He practised in Rochester from 1828 until about 1864, when he moved to the vicinity of New York City.

In 1830 he married Elizabeth Manson.

His death occurred December 6, 1866, by drowning in the Hudson River while crossing from Jersey City to New York.

Such are the bits of information that have been preserved about this noteworthy character. As regards his contributions to the advancement of surgical practice we must turn to the *Buffalo Medical Journal* for August, 1851. In this publication appeared an abstract of a paper which Dr. Reid read before the Monroe County Medical Society May 8, 1850. The same facts were published in the *Boston Medical and Surgical Journal* for December 31, 1851, (Vol. XLV., pp. 441-447), and a complete exposition of the subject was presented at the annual meeting of the Medical Society of the State of New York, February 3, 1852, appearing in the transactions of that year as a paper of seven-  
 eenteen pages, with diagrams.

It is to be understood that at the time Dr. Reid arrived at the true principles and rationale of the method of reduction of dislocation of the head of the femur on the dorsum ilii, the common practice, enunciated by Sir Astley Cooper, was what Reid called a cruel method of extension of the limb, using pulleys and blind brute force, the object being to tire out the muscles which were supposed to prevent the reduction by their contraction. We know now that the traction ruptured the Y ligament. Nathan Smith and others had found as long ago as 1831 that some sort of flexion often effected reduction. The manœuvres advocated were haphazard and were not founded either on investigation or experience.

Dr. Reid tells us that his attention was directed to the subject of dislocation of the hip during the years 1826, '27 and '28, while a student of medicine in Rochester, where he saw several cases that were treated by the leading surgeons of the time by inquisitorial torture of the patients, often with poor end results. Ever after he gave the subject thought and for ten years previous to 1850 the question how he might help such patients was seldom out of his mind.

By manipulating the skeleton and by dissecting and testing the strength of the muscles of a sheep's leg he decided that the essential muscles about a dislocated hip were not contracted, but overstretched, and that a little too much overstrain would rupture them. These views were confirmed in 1849, after he had had several cases of reduction, by the dissection of both hip joints of a human subject in conjunction with Dr. E. M. Moore, professor of surgery in the Woodstock and in the Berkshire medical schools. Both joints were dislocated, after being dissected, and were reduced by Reid's method, it being noted that too strong flexion of the thigh hindered reduction and that direct traction without flexion partly carried away the capsular ligament. Reid thought that flexion, as it relaxed the muscles, was the proper procedure in cases of dislocation and in the case of the hip he advocated flexing the leg on the thigh, the thigh on the abdomen, adduction to the sound side, then abduction and outward rotation.

He was called to his first case in the spring of 1844, a stout Irish woman who had fallen down a flight of steps and dislocated her hip four days previous to his visit. In the presence of four physicians Dr. Reid, using his method, reduced the dislocation in three minutes with very little force and with trifling pain. This was before the advent of surgical anesthesia. He reported three cases, all reduced without an anesthetic, in his paper read before the Monroe County Medical Society, and in his later paper gave the data of two cases reported by other surgeons, one with an anesthetic and the other without, both reduced successfully by his method.

Although Reid did not appreciate the full importance of the capsular ligament in the mechanism of dislocation and knew nothing of its accessory Y-ligament—a structure described in detail by H. J. Bigelow some twenty years later—he worked out in an intelligent manner the correct method of rectifying this serious injury, thus obviating great and unnecessary suffering besides much crippling of joints in coming generations, and he is therefore entitled to full credit and the gratitude of posterity.

WALTER L. BURRAGE, M.D.

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## CHANGES IN THE WORKMEN'S COMPENSATION LAW.

THE Massachusetts Legislature this year, acting favorably upon recommendations made by the Industrial Accident Board, has reflected the spirit of the times in enacting many far-reaching amendments to the Workmen's Compensation Act. Such action was not unexpected, in view of the fact that nearly every man and woman who labors for his livelihood is affected to a greater or lesser degree by this law, which divides annually among the workers of the Commonwealth and those who treat them from a medical and surgical standpoint, upwards of four million dollars. The recommendations of the progressive board which administers this law reflect the wishes of labor generally and the favorable action of the legislative body indicates that the great bulk of those elected to govern us are in sympathy with the cause of the workingman.

Among the important changes are the

amendments to increase the minimum weekly compensation from five dollars to seven dollars; the maximum weekly payments, from fourteen to sixteen dollars; the change in the maximum weekly compensation which may be made for partial compensation from ten dollars to a straight two-thirds of the difference between an employee's average weekly wages at the time of his injury and the average weekly wages which he is able to earn thereafter; the elimination of the time limit of 500 weeks from the date of the injury during which an employee may receive partial incapacity compensation and the adoption of an amendment which allows an employee to receive partial compensation as long as his special fund of \$4,000 has not been exhausted; the passage of an act to safeguard the rights of injured employees by providing that the insurance commissioner may have authority to request the appointment of a trustee acting under the direction of the Industrial Accident Board to handle certain funds which shall be placed under his supervision; the passage of an amendment to provide that a child or children under the age of sixteen, or over that age if mentally or physically incapacitated, shall be conclusively presumed to be wholly dependent upon a parent who at the time of death was legally bound to support him; the passage of a law making copies of hospital records admissible in evidence; and of an act directing the Industrial Accident Board to investigate the practicability of making use of certain established hospitals and agencies for the restoring of injured employees to industry.

All of these amendments are important, but none are of greater importance than those changing the minimum and maximum and leaving the period during which partial incapacity compensation may be paid, subject only to the exhausting of the sum of \$4,000 in weekly payment. This latter amendment takes care of the permanently disabled employee by setting up against his disabling injury and incapacity an insurance reserve fund of \$4,000 which may be drawn upon at any time during the life of the employee, provided only that the employee is unable to earn full wages because of conditions resulting from the injury and provided further that he has not received the full reserve sum of \$4,000 set apart to protect him. Such protection as this will be a reassurance to the injured employee who returns

to the job which a kindly employer has made for him and who loses the job through no fault of his own, either because of dull business, or a change in the ownership or control of the business. Such a man, if retained even for a period of 20 years and then discharged, will find that his rights are amply protected by the fund which the insurer has been obliged by law to set apart to protect him.

The Workmen's Compensation Act is keeping pace with the spirit of the progressive days. Much of the credit for the progress which has been made in compensation matters is due to the manner in which the law has been administered from a judicial, executive, and medical standpoint, by the Industrial Accident Board, and its executive staff, including the representative of the medical profession who serves as medical adviser.

#### MORTALITY STATISTICS OF INSURED WAGE-EARNERS AND THEIR FAMILIES.

Of considerable interest to physicians should be the information published recently in a volume entitled, "Mortality Statistics of Insured Wage-Earners and Their Families." This publication presents the mortality statistics of the industrial policy-holders of a large life insurance company for the six-year period, 1911 to 1916, with a supplement for the year 1917. The statistics are essentially those of the wage-earning group of the population. In view of the very large exposure, the very considerable period of time covered, and the care exercised in gathering, editing, and tabulating the data, it is probable that these statistics constitute the most sensitive index now available of mortality and its causes among wage-earners and their families. The volume has been submitted by the insurance company to the public health movement in the United States and Canada.

This report presents a detailed analysis of the facts of mortality among the industrial workers of the country. All the important industries and occupations are represented: laborers form the largest single group, followed by teamsters, drivers, and chauffeurs, by machinists, by textile mill operatives, and by clerks and office assistants. There are represented also the members of wage-earners' families. The facts collected in this book of the

mortality characteristics of both the white and colored races are important from the point of view of comparative mortality.

The total death rate of 635,449 during the years 1911 to 1916, inclusive, represents a death rate of 1,000 exposed. Considering all ages of the mortality experience of males, the colored race shows a mortality rate nearly 50 per cent. higher than that of the white race. Tuberculosis, all forms, was responsible for 17.4 per cent. of all the deaths; "organic diseases of the heart" for 11.9 per cent.; pneumonia (all forms), 9 per cent.; and Bright's disease, 8.2 per cent. The entire group of deaths from "external causes," of which accidents form the largest part, was responsible for 8.0 per cent. Deaths from cancer amounted to 5.9 per cent.; from cerebral hemorrhage and apoplexy, 5.8 per cent.; and from the four communicable diseases of childhood,—measles, scarlet fever, whooping cough, and diphtheria,—4.0 per cent.

The complete and accurate data collected in this volume should be helpful to physicians and to others who are guided in their work by medical statistics, and are a valuable contribution to the advance of medical science and to the public health movement.

#### MEDICAL NOTES.

MEDICAL LIBRARY ASSOCIATION.—The twentieth annual meeting of the Medical Library Association was held on June 9, 1919, at Atlantic City. The president, Dr. William Browning, delivered an address on the growth and development of the Association. Among other subjects considered were methods for extending the use of a medical library, cataloguing and classifying for a medical library, the advantages and disadvantages of the open shelves, the Cincinnati General Hospital Library, the St. Louis Medical Society Library, William Rawlins Beaumont, the use of the caduceus by the army as the insignia of the medical officer, and the flying ambulance. Members of the Association discussed methods of making literary material available, how far reference work should be done for readers, the care of reprints, the essentials for a small medical library, and how much non-medical material a medical library should acquire. Reminiscences and anecdotes about Sir William Osler, one of those

actively interested in the founding of the Association, were given by various members.

**INCREASE IN DRUG PRICES.**—It has been reported that with few exceptions the prices for pharmaceutical drugs and allied products have been increasing during the past few weeks. There has been considerable trading for this time of the year, and steps which have been taken to dispose of Government surplus have in some instances resulted in increased stability. Plans are now being made to develop export trade with European and South American markets. Many orders have already been received from many places which were cut off during the war. It is probable that America is in a good position to foster and encourage world trade in chemicals, drugs, dyes, and pharmaceuticals.

It has been announced that there has been a reduction amounting to ninety cents to one dollar an ounce in all forms of morphine.

**MEDICAL DEPARTMENT OF THE ARMY.**—The number of vacancies existing in the Medical Department of the Army have made it necessary for the War Department to begin active recruiting. Post commanders have been notified that for the purpose of filling the existing vacancies in the permanent Medical Corps of the United States Army, applications will be received by the adjutant general of the Army from those who desire appointment. Appointments will be made in the following order: emergency medical officers now in service, members of the Medical Section, Officers' Reserve Corps, who served with credit as officers during the war, former emergency medical officers who served with credit during the war.

The regulations require that persons hereafter commissioned in the Medical Corps shall be citizens of the United States, between the ages of twenty-two and thirty-two years, and original appointments shall be in the grade of first lieutenant. All applicants whose applications are considered satisfactory will be authorized by the adjutant general of the Army to appear before a convenient examining board to determine their fitness as to mental, moral, physical, and professional qualifications. Applications will not be approved in these cases where, on Sept. 30, 1919, the applicant will be more than thirty-two years of age.

All persons eligible for and desiring appointment should address a letter of application for examination to the adjutant general of the Army.

**AMERICAN HOSPITAL FOR GREAT BRITAIN.**—At a recent meeting at the Royal Society of Medicine of American residents of London, the project to found in London an American hospital was discussed. It was decided that an institution shall be organized to give medical and surgical treatment to all classes, irrespective of creed or nationality, and to promote scientific study and research. It is expected that the hospital will cost at least ten million dollars, for which subscriptions will be sought both in the United States and in Great Britain.

**THE PROPOSED MEDICAL FOUNDATION FOR NEW YORK CITY.**—It has been announced by Dr. Royal S. Copeland, health commissioner of New York City, that there is to be organized a New York Association for the Advancement of Medical Education and Medical Science. The constitution and by-laws of the association have been adopted and an application for a charter filed. Dr. Wendell C. Phillips has been elected president, and Dr. Haven Emerson, secretary. The association will have four primary objects:

First, to improve and amplify the methods of graduate and undergraduate teaching. Second, to perfect plans for utilizing the vast clinical material of the city for teaching purposes and to make use of teaching talent now unemployed. Third, to bring about a working affiliation of the medical schools, hospitals, and laboratories, as well as the public health facilities of the city, to the end that the best interests of medical education may be conserved. Fourth, to initiate the establishment of a medical foundation in New York City whereby funds may be secured to meet the financial requirements of all forms of medical education and investigation.

Membership in this organization will be divided into two classes: one a general membership, including all physicians in good standing, teachers of auxiliary sciences, and investigators of problems relating to medicine; the other, a corporate membership of medical teachers and medical men with hospital appointments or affiliations. The corporate membership is limited by the constitution to not over one hundred and fifty.

In addition to Dr. Phillips and Dr. Emerson, the following officers of the association have been elected: Dr. George D. Stewart, president of the New York Academy of Medicine, first vice-president; Dr. Glentworth Butler, chief medical consultant of the Long Island College Hospital, second vice-president; Dr. Arthur F. Chace, stomach specialist of the Post-Graduate Hospital, treasurer. The trustees are Colonel Charles H. Peck, Dr. William Francis Campbell, Dr. John E. Hartwell, Dr. Frederick Tilney, Dr. Otto V. Huffman, Dr. Adrian Lambert, Dr. Samuel A. Brown, Dr. James Alexander Miller, and Dr. George W. Kosmak.

**ACCIDENT PREVENTION.**—The war has compelled us to realize the importance of conserving the human element in industry. It has been estimated, as a result of a recent investigation, that about eighty-eight per cent. of accidents are due not directly to machinery but to a lack of necessary education of the men in the hazards of their respective occupations. In order to assist in the development of an educational safety program, the Working Conditions Service of the United States Department of Labor has issued a pamphlet describing methods of getting the interest of the workmen and influencing their habits. This pamphlet, entitled "How to Give Illustrated Lectures on Accident Prevention to Workmen," presents data which indicates that the most effective way of promoting accident prevention is through the use of short talks about thirty or forty minutes long, illustrated with slides and moving pictures, showing the results of accidents, rather than how to avoid them.

Thousands of dollars have been spent in safeguarding machinery; this effort to increase the attention which is being paid to safeguarding the interests and efficiency of the men who operate the mechanism is to be commended.

**PUBLIC SERVICE—THE PHYSICIAN'S DUTY.**—The professional man generally, and the physician in particular, renders to the public a service of which the average citizen is not capable. Through his education and experience, and his understanding of the interests of varied groups of individuals, he gains a broader point of view which makes it possible for him to exercise unusual judgment in the direction of the affairs of life. A letter recently issued by the United

States Treasury Department calls attention to the fact that the physician's influence on the community is considerable and his example far reaching. During the war, the public spirit of the profession has been admirably demonstrated. The Government has reminded us that there is still further opportunity for the physician to show his character as a public benefactor—by supporting the campaign for the sale of Thrift Stamps and War Saving Stamps.

#### BOSTON AND MASSACHUSETTS.

**BRITISH RECOGNITION OF THE HARVARD MEDICAL UNIT.**—It has been reported that the following members of the Harvard Medical Unit, which served in the British Army during the war as General Hospital Number 22 of the British Expeditionary Force, under the command of Lieutenant-Colonel Hugh Cabot, have been awarded decorations by the British Government:

Lieutenant-Colonel Hugh Cabot, officer commanding, Companion of the Most Distinguished Order of Saint Michael and Saint George (C.M.G.) (Military Division). Three times mentioned in despatches.

Major Varaztad Kazanjian, chief, oral surgery, Companion of the Most Distinguished Order of St. Michael and Saint George (C.M.G.) (Military Division). Three times mentioned in despatches.

Major E. Granville Crabtree, chief, surgical division, Most Excellent Order of the British Empire (O.B.E.) (Military Division).

Major George C. Shattuck, chief medical division, Distinguished Service Order (D.S.O.).

Captain Francis B. Grinnell and Captain Edward Harding, Military Cross (M.C.).

Lieutenant-Colonel William E. Faulkner, Lieutenant-Colonel Allen Greenwood, Captain Harry W. Woodward and Lieutenant Walter J. Dodd (deceased), mentioned in despatches.

**WEEK'S DEATH RATE IN BOSTON.**—During the week ending August 2, 1919, the number of deaths reported was 173 against 200 last year, with a rate of 11.32 against 13.30 last year. There were 31 deaths under one year of age against 48 last year.

The number of cases of principal reportable diseases were: Diphtheria, 32; scarlet fever, 6; measles, 10; whooping cough, 30; typhoid fever, 3; tuberculosis, 43.

Included in the above were the following

cases of non-residents: Diphtheria, 4; tuberculosis, 8.

Total deaths from these diseases were: Diphtheria, 2; whooping cough, 1; tuberculosis, 13.

Included in the above were the following non-residents: Diphtheria, 1.

**EXAMINATION FOR MEDICAL APPOINTMENT.**—An examination for the office of District Health Officer or Epidemiologist in the Sub-division of Venereal Diseases of the Massachusetts Department of Health is to be held for medical men between the ages of twenty-three and thirty-five years and others under forty years who have had at least five years' experience in Public Health Work. Physicians desiring further information about these positions should communicate with Eugene R. Kelley, M.D., State Commissioner of Health, State House, Boston.

### Miscellany.

#### CHANGES IN THE WORKMEN'S COMPENSATION LAW.

##### CHAPTER 53.

THE COMMONWEALTH OF MASSACHUSETTS,  
In the Year One Thousand Nine Hundred and Nineteen.  
**RESOLVE.**

*Directing the Industrial Accident Board to Investigate the Practicability of Using for Disabled Industrial Workers the new Contrivances for Restoring Injured Soldiers to Productive Employment.*

**RESOLVED:** That the Industrial Accident Board shall investigate the practicability of using for persons incapacitated by industrial accidents the various mechanical and surgical devices, and methods of training and education, that have been invented or developed during the present war for the purpose of restoring injured soldiers and sailors to health and to productive employment. The board shall determine what steps to this end should be taken by the Commonwealth, and shall make a survey of the resources, public and private, both actual and potential, which are available for the purpose. The Board shall report to the next General Court with drafts of such legislation as it may deem expedient, and may expend such sum not exceeding one thousand dollars as may hereafter be appropriated.

Approved, June 24, 1919.

Effective, Sept. 22, 1919.

##### (GENERAL ACT)

##### CHAPTER 197.

THE COMMONWEALTH OF MASSACHUSETTS,  
In the Year One Thousand Nine Hundred and Nineteen.  
**AN ACT.**

*Increasing the Minimum and Maximum Weekly Compensation for Total Incapacity Payable to Injured Employees.*

Be it enacted by the Senate and House of Representatives in General Court Assembled and by the authority of the same, as follows:—

Section nine of Part II of chapter seven hundred and fifty-one of the acts of nineteen hundred and eleven, as amended by section four of chapter seven hundred and eight of the acts of nineteen hundred and

fourteen, by section one of chapter two hundred and forty-nine of the General Acts of nineteen hundred and seventeen, and by chapter one hundred and thirteen of the General acts of nineteen hundred and eighteen, is hereby further amended by striking out the word "fourteen," in the fourth line, and substituting the word:—sixteen,—and striking out the word "five" in the fifth line, and substituting the word:—seven,—so as to read as follows:—

**Section 9.** While the incapacity for work resulting from the injury is total, the association shall pay the injured employee a weekly compensation equal to sixty-six and two-thirds per cent. of his average weekly wages, but not more than sixteen dollars nor less than seven dollars a week; and in no case shall the period covered by such compensation be greater than five hundred weeks, nor the amount more than four thousand dollars.

Approved, May 29, 1919.

Effective, Aug. 27, 1919.

##### (GENERAL ACT)

##### CHAPTER 198.

THE COMMONWEALTH OF MASSACHUSETTS,  
In the Year One Thousand Nine Hundred and Nineteen.  
**AN ACT.**

*Providing for the Admissibility of Copies of Certain Hospital Records as Evidence before the Industrial Accident Board.*

Be it enacted by the Senate and House of Representatives in General Court assembled and by the authority of the same, as follows:—

Part III of chapter seven hundred and fifty-one of the acts of nineteen hundred and eleven is hereby amended by inserting after section eighteen the following new section:—

**Section 19.** Copies of hospital records kept in accordance with the provisions of chapter three hundred and thirty of the acts of nineteen hundred and five, as amended by chapter two hundred and sixty-nine of the acts of nineteen hundred and eight, and of chapter four hundred and forty-two of the acts of nineteen hundred and twelve, certified by the persons in custody thereof to be true and complete, shall be admissible in evidence in proceedings before the Industrial Accident Board, or any member thereof. The Board, or any member, in its or his discretion, before admitting any such copy in evidence, may require the party offering the same to produce the original record.

Approved, May 29, 1919.

Effective, Aug. 27, 1919.

##### (GENERAL ACT)

##### CHAPTER 204.

THE COMMONWEALTH OF MASSACHUSETTS,  
In the Year One Thousand Nine Hundred and Nineteen.  
**AN ACT.**

*Relative to the Payment to Certain Dependent Children of Benefits under the Workmen's Compensation Act.*

Be it enacted by the Senate and House of Representatives in General Court assembled and by the authority of the same, as follows:—

Section seven of Part II of Chapter seven hundred and fifty-one of the acts of nineteen hundred and eleven, as amended by section three of chapter seven hundred and eight of the acts of nineteen hundred and fourteen, is hereby further amended by inserting after paragraph (c) the following new paragraph:—

(d) A child or children under the age of sixteen (or over the said age but physically or mentally incapacitated from earning) upon a parent who was at the time of his death legally bound to support, although living apart from, such child or children.

Approved, May 29, 1919.

Effective, Aug. 27, 1919.

## (GENERAL ACT)

## CHAPTER 205.

THE COMMONWEALTH OF MASSACHUSETTS.  
In the Year One Thousand Nine Hundred and Nineteen.  
AN ACT.

*Relative to the weekly Payments to Injured Employees in Cases of Partial Incapacity.*

Be it enacted by the Senate and House of Representatives in General Court assembled and by the authority of the same, as follows:—

Part II of chapter seven hundred and fifty-one of the acts of nineteen hundred and eleven, as amended by section five of chapter seven hundred and eight of the acts of nineteen hundred and fourteen, is hereby further amended by striking out section ten and substituting the following:

*Section 10.* While the incapacity for work resulting from the injury is partial, the association shall pay the injured employee a weekly compensation equal to sixty-six and two-thirds per cent. of the difference between his average weekly wages before the injury and the average weekly wages which he is able to earn thereafter, but not more than sixteen dollars a week; and in no case shall the amount of such compensation be more than four thousand dollars.

Approved, May 29, 1919.

Effective, August 27, 1919.

## (GENERAL ACT)

## CHAPTER 226.

THE COMMONWEALTH OF MASSACHUSETTS.  
In the Year One Thousand Nine Hundred and Nineteen.  
AN ACT.

*Relative to the Payment by Insurance Companies of Death or Compensation Benefits under the Workmen's Compensation Act.*

Be it enacted by the Senate and House of Representatives in General Court assembled and by the authority of the same, as follows:—

*Section 1.* The insurance commissioner, hereinafter called the commissioner, in his discretion, may at any time require an insurance company, hereinafter called the company, to deposit in cash or approved securities with the treasurer and receiver general, the present value as computed by the commissioner of all or any part of its outstanding claims incurred under the provisions of chapter seven hundred and fifty-one of the acts of nineteen hundred and eleven and acts in amendment thereof and in addition thereto. The treasurer and receiver general shall make from such deposit the payments to those entitled thereto under the said chapter, and in the manner provided therein, upon the written request and under the direction of the industrial accident board, hereinafter called the board, or may, if the company so elects, transfer from time to time to a trustee appointed by the company and approved by the board such part of the funds as may be reasonably necessary for making the said payments promptly, and the trustee shall make the same in accordance with the instructions of the board. The treasurer and receiver general shall keep a separate account with the company of the amount so received, the amount of interest earned and the payments made. In case the amounts so deposited prove, or seem likely to prove, to be insufficient from transfer of funds or otherwise, the commissioner may require the company to deposit such additional sums as he may deem necessary. If the amounts deposited prove to be larger than are required, portions thereof may from time to time be refunded to the company by the treasurer and receiver general, subject to the approval of the board and the commissioner. If any balance remains after the payment of all sums due to injured workmen or their dependents, the treasurer and receiver general shall return the balance to the company upon notice from the board that there is no likelihood of

further payments becoming due on account of the said claims.

*Section 2.* The commissioner shall compute the present value of outstanding claims on the basis of information to be furnished to him by the board, and shall assume a rate of interest not higher than four per cent.

*Section 3.* When a deposit is made with the treasurer and receiver general as provided in section one, the company shall pay to the treasurer and receiver general a reasonable amount for the expenses of his office, for the custody of the deposit, and for making the payments therefrom.

*Section 4.* An insurance company which fails to make the deposit aforesaid when it is required under this act shall cease to write policies of insurance in this commonwealth until the required deposit is made.

Approved, June 11, 1919.

Effective, Sept. 9, 1919.

## (GENERAL ACT)

## CHAPTER 272.

In the Year One Thousand Nine Hundred and Nineteen.  
AN ACT.

*To Establish a Special Fund in the Custody of the Treasurer and Receiver General for the Purpose of Paying Additional Compensation to Certain Injured Employees.*

Be it enacted by the Senate and House of Representatives in General Court assembled and by the authority of the same, as follows:—

*Section 1.* For every case of personal injury resulting in death, covered by the provisions of chapter seven hundred and fifty-one of the acts of nineteen hundred and eleven and acts in amendment thereof and in addition thereto, in which there are no dependents, the insurance company insuring the liability of the employer shall pay into the treasury of the commonwealth the sum of one hundred dollars. All payments hereunder shall constitute a special fund, of which the treasurer and receiver general shall be the custodian. He shall make payments therefrom for the purposes specified in the following section upon the written order of the industrial accident board.

*Section 2.* Whenever an employee who has previously suffered a personal injury resulting in the loss by severance, or the permanent incapacity, of one hand, at or above the wrist, one foot at or above the ankle, or the reduction to one tenth of normal vision of one eye, with glasses, incurs further disability by reason of the occurrence of a subsequent personal injury arising out of and in the course of his employment, through the loss by severance, or the permanent incapacity, of either a hand, at or above the wrist, or a foot, at or above the ankle, or the reduction to one-tenth of normal vision in an eye, with glasses, he shall be paid the compensation provided for by sections nine and ten of Part II of said chapter seven hundred and fifty-one; or if death results from such subsequent injury, his dependents shall be paid the compensation provided for by sections six and seven of said Part II, in the following manner: One-half of such compensation shall be paid by the treasurer and receiver general from the fund established under section one, and the other half by the insurance company insuring the liability of the employer at the time of the subsequent injury; except that the additional compensation due under section eleven of said Part II for the specified injury so sustained, shall be paid solely by the company insuring liability at the time of the subsequent injury.

*Section 3.* All cases not specifically provided for in the above section shall be covered by, and compensation shall be paid under, the provisions of said chapter seven hundred and fifty-one and acts in amendment thereof and in addition thereto.

Approved, July 1, 1919.

Effective, Sept. 29, 1919.



# The Boston Medical and Surgical Journal

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## The Massachusetts Medical Society.

### MEETING OF THE SECTION OF TUBERCULOSIS, JUNE 3, 1919.

#### DIET IN TUBERCULOSIS.

BY I. J. CLARKE, M.D., HAVERHILL, MASS.

THE contents of this paper will consist largely of more or less fixed deductions from the observation of a moderate number of cases of tuberculosis. There is no other disease which so taxes the resources of the dietitian. Many elements enter into the problems of successfully feeding the consumptive.

We have several conditions that cause the loss of appetite which makes feeding all the more difficult. Among these influences may be mentioned the moderate or highly toxic patients, those who cannot avail themselves of exercise or light work as a natural stimulus for an appetite. There is the victim of more or less constant functional indigestion so characteristic of certain cases. There is also a psychical phase which prevents eating and prevails more largely in institutions. We have various complications, particularly of the intestinal type, that interfere with eating. Many patients enough so much they have not the courage or strength to eat enough. In our sanatoria the foreign born

hold a strong aversion to the American dietary. Constipation plays its part. The overindulgence in sweets, nuts, and fruit works to a decided advantage. Too hearty mid-morning and afternoon lunches frequently interfere with the limits of digestion, therefore affecting what would be a more normal appetite. It has seemed wise to me to lessen the amount of food for supper to those patients who are carrying a high temperature, as it is natural to presume that their powers of digestion would be less at this time of day. We must all realize at the start that the one, and perhaps the most important, factor in feeding the consumptive is that all food should be of first quality; there should be no substitution in the line of fats. In the preparation of foods the utmost care should be taken that it is all cooked and served in a proper manner. A good sized book could be written upon this latter subject to the very great advantage of our best cooks. Too much of all food is cooked by rule, too little by reason. Even a hungry patient will refuse to eat a poorly prepared meal. It is my belief that institutions should have sufficient money to employ a higher grade of cooks and others having to do with the providing of food. Patients would eat much that is now wasted and the expense would be no greater. Every effort should be made to serve food warm, especially in the winter. A

reasonable variety is essential. Fixed menus for certain days should be avoided as much as possible. The foregoing is preliminary to the old adage that you can lead a horse to water but you cannot make him drink. In other words every effort should be made to place our patients under the most favorable physical and mental conditions and our strongest endeavor to place before them that which is the most palatable and nourishing. Most authorities agree that the diet should be fairly well balanced with a relatively large increase of protein and considerable increase of fat.

Dr. G. Carroll Smith in "What to Eat and Why," states that this rule should be carried out; also that people who eat animal protein are less liable to tuberculosis than vegetarians. He further expresses the opinion that the chief reason for increasing the protein is its importance in building up the cell protoplasm of the body and thus improving metabolism and hence digestion, which is often very much impaired by this disease. The same author advises increased amounts of vegetable protein in the form of peas, beans, etc., to the extent of two hundred grams daily. He further states that fats can better be utilized than carbohydrates to furnish heat and energy and make up the major part of the excess of calories required; that they can be given in a more concentrated form; that they are less bulky than carbohydrates; also that they cause less indigestion; and, further, they are better liked by patients. Dr. Smith recommends taking the average diet for the individual in health and so varying it by the addition of protein, carbohydrates, and fats, that he will have a diet which has a caloric value of about ten or fifteen calories per kilo weight of the body every twenty-four hours in excess of his normal diet. In this way a patient weighing one hundred and fifty pounds with tuberculosis is receiving at least seven hundred and fifty calories more per day than is his average diet in health,—the excess to be varied according to the patient's loss or gain in weight. It is also his opinion that the weight should not be increased much over five or ten pounds the normal weight in normal health, and that of obese patients should not be increased.

Klebs says, "In no other disease is abundant feeding so essential. It must be carried out not only through the abundance of food furnished

but by its quality, by its method of preparation, and by its variety. While it is possible to overburden the digestive tract, this danger is insignificant compared with the likelihood of not giving enough food to make good his waste and to fortify him against the ravages of the disease. That diet is best which taxes the alimentary powers least and furnishes the greatest amount of nourishment. He also states that the demand for an excess of fat is in no disease more pronounced. His experience of two decades has brought him to this attitude in prognosis. If, after two or three months, the patient can take the amount of food that he requires and gain weight on it, his prognosis is influenced favorably. He has rarely found the tuberculosis process to be advancing when the patient has been steadily gaining weight for any length of time. He believes that proper nourishment is of the first importance, for patients do well even under adverse climatic and other conditions, but they cannot improve without food and an abundance of it. He also states that the most reliable guide of the patient's improvement is his gain in weight; he should be weighed each week at the same time of day and under the same physical conditions and his food consumption should be regulated by the results."

Most authorities agree that a tuberculous patient ought to have from 3000 to 4500 calories of food elements daily. Many of the markedly advanced types cannot take care of more than 2000. It is my opinion that enough attention has never been given to diet in either acute or chronic disease. We know that the obese eat the wrong food or too much and that the diet of the thin person is generally faulty. They both need regulating. I have often thought that if the taste and desires of the tuberculous patient could be carefully considered and studied from his own standpoint and something of a compromise made from the caloric regulation that he would consume much more food with an equal benefit to himself and incidentally more pleasure. The sick, discouraged, idle consumptive needs all the pleasant anticipation and realization that is possible.

Gautier says, "It has been repeatedly written and said, every tuberculous patient who eats well and gains in weight is curable. This is unhappily not quite an exact statement, but it may be said that among these invalids resistance

is proportional to appetite and to the digestive powers. Those only live long who feed well."

It is not the intention of the writer to go into much detail as regards diet lists but to generalize upon the most desirable articles of food and to comment upon their administration.

Under the head of protein, milk comes first as the most commonly used and the easiest to digest. It is my belief that it should be used as the main food by all very sick persons; that it should take the place of tea very largely. It can be served hot with a bit of salt and well sweetened to be drunk at the end of the meal. Everyone ought to be advised to avoid taking fluids of any kind while masticating their food. Here let me say that the teeth of all patients who have any chance of recovery should have the utmost care. Milk should be given mid-morning and afternoon if the patient eats well at mealtime. If the patient is on a liquid diet an egg can be added at these times. Milk should be kept absolutely sweet and well strained. It can at times be used sour or modified with the *Bacillus Bulgaricus*. Scalding it seems at times to improve a diarrhea. Milk in various other forms may be occasionally used for the individual patient. At least one quart of milk should be taken daily. A little dilution at times favors its digestion.

Eggs in nutritive value and ease of assimilation occupy a position second only to milk. They can be served in a variety of ways with the exception of frying. In feeding those who cannot take solids I often give the double egg nog, which consists of a third of a tumbler of milk, two eggs, salt to taste, one or two teaspoons of sugar, and flavored with vanilla, nutmeg, or chocolate. By this method a patient with pneumonia took twenty-four eggs daily for five days without any trouble. Eggs in the form of steamed custards flavored with chocolate are very palatable. Eggs served as a principal diet or taken raw should always be strictly fresh.

Meat comes third in the dietary of the tuberculous patient. Beef contains the highest per cent. of protein, pork the highest of fat. Corned beef has the highest per cent. of protein of any kind of meat, medium fat bacon the highest per cent. of fat. Lamb and poultry follow next in their protein contents. Skimmed milk cheese yields a higher protein percent than beef. Dried peas and lentils yield a large percent,

also baked beans, and in a lesser proportion, shelled beans. Gelatin shows the highest per cent. of protein of any article of food.

The foods yielding up the highest per cent. of carbohydrates are as follows: arrowroot, 97½; tapioca, 88; corn and rice, about 80; honey, 81; sago, 78; wheat flour, 65, toasted bread, 61; flour in the form of cracker and zwieback show from 70 to 75 per cent.; dried peas and lentils about 60; potatoes, 20; in the form of chips, 39; bananas, 20. Some fruits show high carbohydrates contents, namely dates, 78; raisins, 76; figs, 74; currants, 74; apples, 66, apricots, 62; this comes largely from the sugar they contain. We must never lose sight of the fact that sugar has the next highest caloric content to the high class fat; that it can be added to many articles of food with much benefit to the patient as its taste results in more food being taken.

The highest percentage of fat is obtained from unrefined lard, 94%. Next comes butter, 85%. Then bacon, medium fat, 67%. Smoked bacon, 64%. Pork, 44%. Lean bacon, 42%. Red American cheese, 38%. Potato chips, 39%. Brazil nuts, filberts, and California walnuts yield respectively, 66, 65, and 64%. For fish, salmon and turbot have the highest per cent. of fat.

It is a comparatively easy matter to arrange the diet for the seriously ill as it generally consists of liquids. There is, however, besides those that have a good appetite and digestion, a relatively large per cent. of patients who have a poor or indifferent appetite. It is for this class that we are at present most concerned. We must, of course, consider carefully the limits of a patient's digestion, but taking the average of the type we are now discussing, it seems to me that we should give more attention to the palatability of the food and if necessary disregard its caloric value. There is a satisfaction and encouragement to the patient in having eaten something. The food that a person relishes is said to digest more easily.

It is quite impossible to force nourishment for months and years as is done for the acutely sick during a few days. The secret of the problem is to make eating the most attractive feature of the cure.

With your permission I will read you a week's menu of the Haverhill Sanatorium as an illustration:

Breakfast—Cereal, beans and fishcakes, rolls, milk, tea, and coffee.

Dinner—Roast chicken, potatoes, summer squash, lemon ice cream.

Supper—Cold meat, sliced tomatoes, rolls, cake, stewed prunes, milk, tea.

Breakfast—Boiled eggs, cereal, corn bread, boiled sweet and white potatoes, coffee, milk.

Dinner—Broiled steak, potatoes, sliced tomatoes, cracker pudding with cream, milk, tea.

Supper—Cold meat, hot biscuit, preserved pears, milk, tea, coffee.

Breakfast—Cereal, scrambled eggs, baked potatoes, hot gems, milk, coffee, tea.

Dinner—Boiled cod with egg sauce, potatoes, cabbage, apple pie, milk, tea.

Supper—Cold meat, fried potatoes, cake, apple sauce, milk, tea.

Breakfast—Cereal, scrambled eggs, muffins, milk, coffee.

Dinner—Roast beef, potatoes, tomato soup, turnip, frozen jelly, milk and tea.

Supper—Fish chowder, fried potatoes, cold meat, milk, tea.

Breakfast—Corn meal mush, fried eggs, bacon, corn cake, coffee, milk, tea.

Dinner—Irish stew, sweet potatoes, Washington pie, milk, tea.

Supper—Cold ham, fried potatoes, bread, chocolate cake, milk, tea.

Breakfast—Boiled eggs, plain potatoes, cereal, hot biscuit, coffee, tea, milk.

Dinner—Boiled haddock, creamed sauce, boiled potatoes, boiled onions, rice pudding, milk and tea.

Supper—Clam chowder, fried potatoes, cake, preserved pears, milk, tea.

Breakfast—Oatmeal cereal, griddle cakes, maple syrup, coffee, milk, tea.

Dinner—Boiled dinner, rice pudding, milk, tea.

Supper—Baked beans, brown bread, stewed prunes, milk, cocoa, tea.

Breakfast—Cereal, baked beans, fish cakes, milk, coffee, tea.

Dinner—Roast chicken, giblet sauce, stewed tomatoes, summer squash, boiled onions, mashed potatoes, vanilla ice cream, milk and tea.

Bread is served with all meals.

## DIET IN TUBERCULOSIS.

BY ROY MORGAN, M.D., WESTFIELD, MASS.,

*Assistant Superintendent, Westfield State Sanatorium.*

HAPPILY the time of *forced* feeding in tuberculosis has passed. But it seems to us that there is still a tendency to *over* feeding.

At the Westfield State Sanatorium we have for a long time felt that lunches should be abolished as a routine and that adult patients should have only the three meals per day. We long ago abandoned the custom of giving raw eggs between meals and for the past year have served no milk for lunches. We based this belief on the following considerations:

In the first place, the stomach as well as other organs needs rest, and it does not get the proper rest if food is put into it oftener than three times a day. Under these conditions the digestive organs fail to utilize the surplus, which is really wasted. It may be worse than wasted, for the overloading may lead to digestive disturbances.

Again, the idea of over-feeding is fundamentally wrong. We have a patient who is under weight. Therefore, he should eat more in order to regain what he has lost. This seems at first thought to be good logic, but it is very fallacious. If I have a leaky pail it would be just as logical to keep replacing the lost water rather than to mend the leak. So in tuberculosis it seems to us more logical to treat loss of weight by removing, if possible, the toxemia which causes the loss. If we can remove the cause the patient should gain in weight, for we have stopped the leak from the body and it is not necessary to supply extra food to make up for the leakage.

In short, we believe that all the adult tuberculous patient needs is three good meals a day, and that the practice of serving lunches should be abolished.

The main considerations in putting this idea into practice are as follows: It is, of course, necessary that the food be of good quality, be prepared in an appetizing way, and well served; but it is of greatest importance that the food appeal to the taste of the person who is to eat it and, therefore, it is essential that a variety be offered at each meal. A meal may be scientifically correct and be perfectly prepared, but if it does not appeal to the taste of the patient, that meal is little better than

wasted. When the menu permits of a choice, nearly, if not all the patients will eat a sufficient amount.

When you group together patients of both sexes, many nationalities, all ages, and from all conditions of life, this becomes a very important phase of sanatorium administration. Now, if we give our patients only three meals a day, we are up against this problem—no matter how good the meal, a fair percentage of the patients could not or would not eat enough. Under the plan of serving lunches these patients could make up the deficit on milk and eggs at lunch time. If lunches were omitted they were deprived of this opportunity. We solved this quite successfully by the establishment of a cafeteria system. There are many things to be said in favor of this system, but for our purpose here it may be said that it goes a long way towards meeting the problem of individual taste. If there is one thing on the menu which a certain person cannot eat there is a choice of other things which he can make a meal of.

We put this system in operation in March, 1916. When we became convinced that it was successful and that each patient was reasonably certain not only of receiving but of eating three meals a day, we decided to omit the lunches.

The result may be briefly stated as follows:

1. Our patients have gained as much, or more, than under the old system.
2. We have had a very noticeable decrease in digestive disturbances.
3. The patients are satisfied that they are getting enough nourishment and relish their meals better.

4. There is considerable saving in food cost.

Recently we made inquiries to learn how the subject of lunches was dealt with by other institutions. A questionnaire was sent to practically all leading institutions in other parts of the country, and to a few men in private practice.

We have received 31 answers. Sixteen of these say that lunches are necessary, twelve say they are not needed, and three use them in a restricted way. Three of the answers are of special interest and will be quoted here.

Dr. Holden, of the Agnes Memorial Sanatorium at Denver, writes as follows: "I have followed the no-lunch policy at this institution for 13 years. To prove the value of the plan

I placed half of my patients on three meals a day and the other half on two and some times three lunches, in addition to three meals, over a period of three months. At the end of that period we found the three-meal patients showed marked improvement over the five-meal patients, in gain of weight, absence of stomach complications, and in general well being.

"The only exceptions we make are in cases convalescing from some acute illness or those placed on a diet for a short time to correct some digestive disturbance."

Dr. Perry, superintendent Hampshire County Sanatorium, says: "At the two military hospitals where I was stationed I was pleased to find the opinion among some of the leading tuberculosis men was that the lunch business was overdone and the rule was rigidly enforced that no extra diet should be given the men except when under weight and also able to digest the food well."

Dr. Heise, of Trudeau Sanatorium, Saranac Lake, answered as follows: "We are opposed to the idea of extra nourishment altogether except in the case of infirmity patients who are losing weight or are far under weight, or whose particular condition may indicate frequent light nourishment. Ordinarily we do not give lunches and think that the results are better so, for the digestive system is not overworked, the appetite at meal time is better, and the needless expense and work are spared. In rare cases we do order extra nourishment between meals. But for some months past we have not had occasion to order it for a single case outside of the infirmary."

To summarize: We feel that lunches should not be served to the tuberculous adult patient except as a special prescription for an unusual condition. In our experience, serving only the three meals per day has given better results, both from the standpoint of the patient and the institution.

#### DISCUSSION.

DR. WM. R. P. EMERSON, Boston: I have been much interested in the papers that have just been read because I believe the problem of tuberculosis is the problem of nutrition, and not enough attention has been paid to this subject, especially in children, where the question of proper nutrition and growth has been almost universally overlooked.

During the past seven months, at the invitation of the Secretary of the Association for the Relief and Control of Tuberculosis, I have been conducting nutrition clinics and classes at Dill-away Street with malnourished children brought in by the tuberculosis nurses from tubercular families. Although these children had been under the observation of excellently trained tuberculosis and school nurses, we found in a group of fifty, conditions and habits as follows:

Tea and coffee habit .....	72%
Insufficient food taken .....	28%
Fast eating .....	36%
Late hours .....	64%
Homes disorganized by long sickness .....	26%
Extra work, as music, languages, employment after school, etc. ....	54%

Forty percent had diseased adenoids or tonsils. Although there has been much delay in securing adenoid and tonsil operations on account of war conditions and although we have not been able to get these children relieved from school pressure except in occasional instances, these malnourished children have not only come up to the expected rate of gain for normal children but have exceeded it while under treatment by 71%.

A child's parents, brothers and sisters may have died of tuberculosis, the child himself may be malnourished, retarded in growth from one to four years, but he cannot be excused from a school exercise to go home for a light lunch, which the school does not provide, nor for a short rest period, opportunity for which the school does not furnish, unless the school principal gives permission. No request from either private or school physician makes any difference. The greatest obstacles in the treatment of this group of children has been school pressure and the schools.

Another group of similar children at 44 Dwight Street, who came from schools where the principals cooperated with us, gained at the rate of 369% above the average rate of gain of well children—exceeding our group at Dill-away Street by nearly 300%.

In regard to diet, we find it does not matter so much what is served a patient as what he actually takes. It is impossible to know how much is taken without some measure. I have brought a small food exhibit showing how simple it is to measure a child's diet by having either the child himself or the parent write down for 48 hours exactly what is taken; then the reckoning in approximately 100 calorie amounts is very simple. Patients should be divided into three groups: those overweight, those of normal weight, and those underweight. The food habits of this latter group especially should be ascertained, particularly as regards rapid eating, washing down food with liquids, omitting breakfast, etc.; also their daily activities should be known in order to guard against

over-fatigue. It is not enough to get these children up to normal weight and health, but in doing so we should teach them proper food and health habits so that they will stay well. Also a feature of this work is that not only have these children made this good gain without extra cost of living for the family, but that they gain in their own homes and under their usual surroundings, and thus when they get well they stay well.

The problem of malnutrition, though fundamentally medical, is largely educational. This nutrition work, so important in the prevention of tuberculosis, in our experiment can best be carried on in nutrition clinics and classes in the schools, where machinery used for school inspection and for class work is already established. The establishment of such clinics and classes, I am glad to say, was recommended last month in Washington at the conference on child welfare called by the Secretary of Labor, and these recommendations are being adapted by the secondary child welfare conferences now being held throughout this country.

DR. J. B. HAWES, 2D, Boston. Some time ago, a well known Boston orthopedic physician wished to go up to one of our state sanatoria and teach our patients how to stand properly. He said to me, "Dr. Hawes, the problem of tuberculosis is one of posture." If Dr. Joseph H. Pratt were asked, he would say the problem was one of rest. If Dr. Paterson of the Brompton Sanatorium in England were asked, he would say that the problem of tuberculosis was one of graduated exercises. Dr. Emerson says that the problem is one of nutrition. They are all right, but back of it all is the problem of applied common sense.

I have watched the work of Dr. Emerson and his nutrition classes at the Mass. General Hospital with the greatest interest. It is intensive work, just as Dr. Pratt's Emmanuel Church Tuberculosis Class is intensive work, and as conditions now exist cannot be applied wholesale, much as we would like to do so. When I think of the Rutland Sanatorium with its over-worked group of doctors and nurses, I realize how impossible it would be to carry on all that Dr. Emerson here recommends in regard to the weighing of food, etc. In private practice, however, we can and should do much more than we are doing now; but try as he will, the average busy general practitioner will be quite unable to go into all of the details here mentioned.

I believe that not enough emphasis has been given to the attractiveness of food and the way it is served. Personally, I believe that the average patient will gain more and do better on food which is not so nourishing, perhaps, but which is served attractively, than he will on food with high calorie value unattractively served. Again I would like to see that the pernicious "egg-

nog" is ruled out of the average consumptive's diet. This one article of food alone has upset more stomachs than any one thing that I can mention.

We are all, of course, in accord with the speakers in believing that the stuffing process in consumption is no longer of value. Of course, we ought to know how much and what kind of food our patient is eating, but individualization and common sense, in my opinion, are more important than anything else.

#### COMMUNITY MACHINERY FOR THE DISCOVERY OF TUBERCULOSIS.

By DONALD B. ARMSTRONG, M.D., FRAMINGHAM, MASS.,

*Assistant Secretary, National Tuberculosis Association;  
Executive Officer, Framingham Community Health  
and Tuberculosis Demonstration.*

FROM time to time discussions take place in various communities as to the most effective way in which funds may be expended in the fight on tuberculosis. Arguments are sometimes presented in favor, for instance, of the provision of hospital facilities, and in opposition to the expenditure of funds for nurses and clinics or other community activities.

The futility of arguments in favor of the adoption of a wholly one-sided anti-tuberculosis program is evident. It is like the man who had fifty dollars to spend for a suit of clothes. In looking over the stock in his favorite store he discovered just the suit he wanted for seventy dollars. He then had to decide whether he would purchase a coat and vest now and perhaps a pair of trousers later, or modify his plans and aspirations, to the end of securing immediately a complete suit for fifty dollars. It is just as evident in the case of the man in the clothing store as it is with the community desiring to attack tuberculosis, that it is wholly essential to "cover as much of the situation as possible."

In tuberculosis work we need the trousers as well as the coat and vest, and an inadequate hospitalization equipment, with a certain amount of community nursing and clinic service, will be more effective than a 100 per cent. hospital or sanatorium equipment standing alone in the community's defense against the disease. A chain may be only as strong as its weakest link, but a chain of one link is no chain at all.

What, then, constitutes a complete community equipment for tuberculosis detection, control, and

prevention? We cannot here discuss a complete program in detail, but we wish to emphasize certain neglected links in the anti-tuberculosis chain. In brief, it may be stated that recent experience seems to indicate that the chief deficiencies in tuberculosis programs are found on the side of discovery or disease detection. Numerous recent articles and discussions have dealt with the "next step" in the tuberculosis program. On a basis of the Framingham experience, we would say that the "next step" is the *first step*, which has long been overlooked, namely, the discovery of tuberculosis.

Up to the present time, communities that have been provided with hospital facilities, clinics, tuberculosis nurses, and a certain amount of educational work have considered themselves admirably equipped for tuberculosis work. May it not be that too much, not reliance, but responsibility, has been placed upon these community devices, particularly upon the public health nurse? The clinics and the nurse in the community have been expected and have failed to discover tuberculosis. As follow-up and treatment instrumentalities, they are most essential. It would seem, however, that a community which attempts only a nursing and clinic program is aiming at the third step in anti-tuberculosis work and is ignoring at least two essential preliminary measures, namely, social organization and disease detection. Without these preliminaries, equipment for treatment cannot be most effectively employed.

In spite of the excellent standards established and attained in tuberculosis nursing, in spite of the unjustifiable demands for the discovery of tuberculosis which have been placed upon the nurse in the so-called tuberculosis surveys, it is evident everywhere that the nurse cannot and should not be depended upon to unearth tuberculosis. Essentially this is a medical job, and requires medical machinery; and no group of individuals is more ready to acknowledge this fact than the public health nursing leaders in this country.

By way of illustration, in Framingham, at the beginning of the Health Demonstration in the spring of 1917, a health census or sickness canvass was undertaken, which was in part, at least, a tuberculosis survey by nurses. This survey disclosed a certain amount of hitherto unknown tuberculosis. A week or so later, in

the first medical examination drive in Framingham, a large section of the sickness census group was given thorough medical examinations. The medical examinations of the very people previously covered by the nurses in their canvass or survey disclosed approximately *nine times* as much tuberculosis as was found by the nurses.

For some time preceding the health demonstration in Framingham, the community possessed an excellent tuberculosis clinic, presided over by one of the most public-spirited and efficient clinicians in Massachusetts. The community also employed one of the best tuberculosis nurses in the state, carried on an active anti-tuberculosis educational campaign, and had at its command reasonably adequate hospital facilities through the state sanatoria and other agencies. With this program, the ratio of known cases to deaths averaged three or four to one, and would undoubtedly have remained about the same during the last two years, if certain measures for the *discovery* of tuberculosis had not been initiated, or, in other words, if certain very important links in the anti-tuberculosis chain had not been welded. These new links have greatly altered this ratio, as will be pointed out shortly.

The previously recognized devices for meeting the tuberculosis problem in Framingham and elsewhere may be briefly enumerated as follows:

1. Improvement in general community sanitation.
2. Public health and anti-tuberculosis educational work, aimed primarily at the prevention of infection.
3. The tuberculosis clinic, for the treatment of home clinic cases.
4. The tuberculosis nurse, incidentally for the discovery of new cases, but primarily for home treatment supervision.
5. Bed provision for institutional cases.

In general, the chief features which have, in a partial way, at least, been added to this program in Framingham, and which may prove useful elsewhere, are as follows:

1. Educational work, not only against tuberculous *infection*, but primarily for constructive hygiene and against tuberculous *disease*.
2. Community organization work, of a more extensive as well as intensive character than hitherto devised, in particular the development of intimate neighborhood leadership, to serve all

phases of the tuberculosis program, including disease detection, treatment follow-up, educational work, etc.

3. The adoption of a more flexible and functional basis for the classification of tuberculosis cases, encouraging the recognition of modifications in the routine observation of special groups, such as the arrested cases, particularly as regards their social and economic adjustment, etc.

4. The use of all possible routine as well as extraordinary devices for the discovery of tuberculosis.

As it is the object of this paper to deal primarily with this last mentioned factor, no further attention will be given here to the problems of education, neighborhood or community organization, disease classification, etc.

What have been the chief methods employed in the discovery of tuberculosis in Framingham, and what have been the results of these special efforts? To answer the latter question first, a crude indication of the results attained may be given by presenting in a very brief way the outstanding facts with reference to tuberculosis incidence in Framingham during the period of the demonstration. For full details regarding tuberculosis findings the reader is referred to Monograph No. 5 of the Framingham Health Station series.

On January 1, 1917, there were 27 known cases of tuberculosis under care. During the year preceding the Demonstration (1916) the total number of cases under observation or treatment was 40. During the first year of the demonstration this number increased to 185 and the total number of living cases, active and arrested, now under observation or treatment in Framingham or in outside institutions, is nearly 200. The total number that has been under observation during the period of the demonstration, including lost cases, fatalities, etc., is at present approximately 275.

As stated previously, the ratio of known cases to deaths before the demonstration averaged three or four to one. On a basis of the medical examination findings, this ratio in Framingham has been increased to 9 or 10 to 1 for active cases, and approximately 21 to 1 for active and arrested cases. The same methods of discovery if applied throughout the United States with average uniform results would disclose for treat-



ment something over one million cases of active tuberculosis, together with another million of arrested cases for modified observation.

The methods employed to discover tuberculosis in Framingham both previously recognized and newly devised, may be summarily indicated as follows:

*A. Previously adopted routine measures.*

1. Private medical practice.—The private practitioners in Framingham, numbering about 25, have, of course, continued as usual to report tuberculosis cases. The phrase "as usual" is somewhat misleading, for, under the stimulus of the work in Framingham, the amount of tuberculosis discovered and reported by the physicians, partly in coöperation with the health station staff, has been materially increased. During the decade 1907 to 1916 preceding the demonstration, all of the physicians of Framingham reported on an average 13 cases a year. During the first year of the demonstration, this number increased to 59. These are, of course, all active cases and for the most part more or less advanced cases.

2.—Tuberculosis Dispensary.—The tuberculosis dispensary, developed under the supervision of the Board of Health, with the help of the tuberculosis nurse, has continued to operate, and has brought to light a certain number of cases.

*B. Newly Established Routine Measures.*

1. Medical Work in the Schools.—With minor and temporary financial assistance from the health demonstration, the official school committee of Framingham has provided for the public schools a practically complete medical, nursing, and clinic system. This includes a full-time school physician, a school nurse, a dental hygienist, a part-time dentist, a dental clinic, together with informal arrangements for other clinic work in connection with the hospitals. On the tuberculosis side this has been very helpful, for the school physician, during the first year of his work, has discovered 11 cases of tuberculosis, active and arrested, in addition to 69 suspects.

2. Factory Medical Work.—Entirely financed by private industry, about half of the industrial workers in Framingham have been under full-time medical, nursing, and clinic supervision, while an incomplete nursing and clinic equipment has been established for additional groups of employees. It is hoped that the future may

see this work developed to cover most if not all of the industrial population, and, as already operated, the system has been helpful in bringing to light tuberculosis cases.

3. Other Community Medical and Nursing Work.—Through the establishment of infant clinics, with infant welfare nursing, pre-school work, a summer camp for children, and other regular medical examination work, an additional substantial portion of the population has been reached on a routine basis with medical facilities.

*C. Special Measures.*

1. The Medical Examination Campaigns.—In addition to the continuous provision of medical examination opportunities for all types of people in the community, the health demonstration has endeavored on several occasions, through medical examination "drives," to carry out "wholesale" examinations on large sections of the population. (See Monograph No. 4 of the Framingham series). Physicians specially experienced in tuberculosis work, from New England State and private institutions, with the help of nurses, examined in the homes about 5,000 Framingham citizens, largely in family groups. In addition, a thousand or more people have been examined through the health station office. These groups, combined with the examination work in the schools, factories, and elsewhere, bring the total number of individuals examined to date in Framingham to approximately 11,000, out of a population of 17,000. These examinations are representative of all age groups, and reflect all sectional, economic, social, and racial factors in the community.

In addition to valuable data regarding the incidence and preventability of minor and serious affections in general, this cross-section examination of a typical American community furnishes an excellent statistical basis for estimating the incidence of tuberculosis. In this work it was found that about one per cent. of those examined were actively tuberculous, and something over two per cent. tuberculous, including both active and arrested cases. The examination work was extremely productive in disclosing tuberculosis cases.

This work was, of course, relatively expensive and was justified mainly on an experimental basis, though it has done a great deal to stimulate the idea of medical examinations as an

annual procedure in the community. It has encouraged people to go to their own physicians for a regular medical inspection, and has made the population sympathetic to the operation of routine medical examination work in schools, factories, and elsewhere. Indeed, while this type of wholesale medical examination work cannot perhaps be advocated as a procedure for all communities, it does serve as a basis for the establishment of routine medical work in the various groups, and it is in its turn made unnecessary by the operation of this routine machinery.

2. Expert Consultation Service.—Of all the devices which have been employed in Framingham, whether routine or special in character, for the discovery of tuberculosis, the consultation work stands first in importance and significance. It is, in fact, the object of this paper to emphasize in particular the advantages of this service and point out that it is, in one form or another, an absolutely essential phase of tuberculosis work, antedating in time, and perhaps exceeding in importance, any of the ordinarily accepted phases in the orthodox tuberculosis program.

The consultation work in Framingham grew out of the medical examination work. It was at first established on a part-time basis, but now requires practically the full-time of one physician, namely, Dr. P. C. Bartlett, the Chief Medical Examiner and Expert Consultant of the Framingham health station. This work requires expert training in the field of clinical tuberculosis, as well as a generous portion of tact and ability. In Framingham, the services of the expert consultant have been offered to all of the physicians and are now used by practically all the men in active practice. The consultant's service is called for in doubtful or difficult cases of respiratory disease and to some extent in the general field of internal medicine. In addition to the presentation of this service to the physicians, measures have been taken of a popular nature to make known to the people the opportunity which the health station offered in this regard. The consultations may be held in the doctor's office, in the health station, or in the homes of the patients, and are provided largely on a free, though partly on a pay basis.

The advantages of the consultation service may be briefly mentioned as follows:

*a.* The presence of an expert consultant,

working in cooperation with the local physicians, examining patients for them, and handing over the patients to the care of the local physicians for treatment under their direction, serves in a sense as a measure for post-graduate education, this work offering opportunities akin to ordinary lecture, clinic and demonstration procedure.

*b.* The work with the physicians tends to improve and standardize routine methods of diagnosis, classification, and treatment.

*c.* The consultation service in Framingham has been of great importance in increasing the amount of known tuberculosis, both active and arrested, under observation or treatment.

*d.* By removing, in many instances, the burden of diagnosis from the local physicians, it encourages the discovery of early cases. During the first year of the demonstration, out of the total number of active cases reported, 42 per cent. were advanced, whereas, in the second year of the demonstration only 19 per cent. of those reported were advanced.

*e.* It directly encourages tuberculosis reporting.

*f.* It tends to improve methods of home treatment, and also increases the percentage of cases institutionalized, the consultant being a man fully familiar with the procedure and opportunities for hospitalization, and being in a position to advise regarding the best method of treatment.

*g.* In many ways the consultation service supplements the other medical, nursing and dispensary community machinery, and, with the routine medical work in schools, factories, and elsewhere, provides on a permanent basis, the primary discovering machinery, essential to the efficient working of all other educational, treatment, and follow-up measures in the complete anti-tuberculosis program.

While this service is relatively expensive for a small community, it is believed that it may readily be established for larger population groups, possibly on a state basis, working either from hospitals and sanatoria, or under the auspices of the State Departments of Health or State tuberculosis associations. Such a service, possibly on an itinerant basis, could cover in a regular way, on schedule time, many sections and communities in the state most needing this service. Finally, this experience in

tuberculosis work may have demonstrated an important device for application to other fields of medicine.

The experience in Framingham has indicated that tuberculosis exists to a greater extent in the average community than has hitherto been supposed. This is supported by the large number of active cases brought to light, mainly through medical examination work and the consultation service. The use of these special methods for the discovery of tuberculosis has also demonstrated that most if not all of the tuberculosis in a community may be discovered and brought under one form or another of treatment or supervision if looked for. It seems, further, that the average anti-tuberculosis program fails in not recognizing the opportunities and obligations in the field of tuberculosis discovery.

The special efforts to find tuberculosis have also shown that there exists in a normal community a large number of arrested cases of tuberculosis, cases that have been active in the past, and that must always be considered potentially tuberculous. Educational work aimed at the prevention of infection is of little value for this group, for they are concerned with disease, not infection. On the other hand, is not that also true for the great mass of the population everywhere? Will not, therefore, a complete tuberculosis program that discovers all types and conditions of tuberculosis in the community, point the way to a new basis for prevention, aimed at the control of tuberculosis disease, rather than chiefly at the suppression of infection? This means for the future an educational attempt based on constructive hygiene, and an effort at health creation. It means, if not less attention to the death rate, at least more attention to the health rate, as measured by happiness in childhood, progress in school, productivity in industry, and general community vitality.

Thus our tuberculosis program merges into general health promotion. Thus do tuberculosis interests lead to a health program of the broadest scope. Thus may we be justified in teaching, not health for health's sake, but health for the sake of a broader community life.

#### DISCUSSION.

DR. J. B. HAWES, 2d, Boston: There is still an amazing amount of fear among the laity in regard to tuberculosis, and the use of that

word itself in regard to dispensaries, surveys, etc., has done a certain amount of harm. In Malden, I note with approval that the tuberculosis dispensary is called a public health dispensary.

One of the very best things Dr. Armstrong has done in Framingham is to make the people realize that he is working for public health, all that goes to make public health; that he is not merely trying to find cases of consumption and to break up families and send patients away to sanatoria.

Another important thing he has accomplished is that he has conducted this experiment without public dissension or external evidence of quarreling. For perhaps the first time in this State, as far as my knowledge goes, a movement of this sort has been carried on with a hearty backing of all the local forces and organizations. This is a rare and welcome occurrence, and speaks very highly for Dr. Armstrong's tact and diplomacy. I believe that one reason for this is that he has emphasized the word "health" and has given less stress to the word "tuberculosis."

Perhaps the most important thing that this movement has accomplished is to demonstrate the need and the field for the free expert consultant. Of course, to a certain extent this has been going on in Boston and elsewhere at the various large dispensaries and clinics. At the Boston Dispensary, the Boston Consumptives' Hospital Out-Patient Department, and at the Massachusetts General Hospital, there are special days when experts are in attendance to give free advice on lung cases. This, however, is done without the presence of the family physician and away from the patient's home. One important point in regard to this form of consultation work that must be considered is to what extent medical charity is being abused. It would be interesting to hear from Dr. Armstrong his opinion as to how many of these patients whom Dr. Bartlett had seen free in consultation should and would gladly have paid a moderate fee.

I believe that the problem of Dr. Wagner, who is about to start on this line of work in Barnstable County, in this particular regard will be a difficult and interesting one.

I hope that it can be arranged before long that the doctors of our four State sanatoria and elsewhere can give consultations of this sort among cities and towns nearby. This is an important field of work which all of us should consider, and consider carefully.

DR. R. W. HASTINGS, Brookline: Three days ago every practitioner in Brookline received a circular letter from the Board of Health stating that each individual practising was free to call upon Dr. Horace K. Boutwell or Dr. Cleveland Floyd at any time for assistance in diagnosis of tuberculosis.

The Board of Health has assumed the expense. It seems to me that this is a step forward in securing just what Dr. Armstrong has brought out and stated was important,—diagnosis in doubtful or suspected cases.

When an x-ray or other special examinations are, in the opinion of the consultant, essential for the diagnosis, those also will be furnished without expense to the patient.

DR. E. O. OTIS, Boston: The experiment of the expert consultant is about to be tried in Barnstable County under the auspices of the Massachusetts Anti-Tuberculosis League.

Dr. Wagner, the superintendent and physician of the local tuberculosis hospital in that county, will devote a portion of his time in going about the county; and in conjunction with, and at the request of the physicians, will examine suspected cases of tuberculosis and advise with regard to the prevention and treatment of the disease.

It is the purpose of the League to extend this expert service to other parts of the State; and it is hoped that the physicians will take advantage of this service. Other states have instituted a similar plan of itinerant tuberculosis experts and found it of great value. The coöperation of the physicians in this experiment is earnestly desired.

It may not be known to all that the American Red Cross has allotted to the National Tuberculosis Association two and a half million dollars to be expended in tuberculosis work; and each State receives an amount equal to the sale in that State of Red Cross seals in 1917. Each local tuberculosis association which is a member of the State League receives its due proportion of the money in accordance with its sale of seals in 1917.

As a result of this donation from the Red Cross, the Massachusetts Anti-Tuberculosis League is enabled to increase and extend its activities, and likewise the local associations.

DR. G. DEN. HUGH, New Bedford: The reader of the paper spoke of community organization as one factor in health work. I would like to call your attention to an organization that has been formed in my city. It seems to me a very good plan of organization for any community that is not too big.

We have approximately 115,000 citizens. The division is made according to districts of approximately 1,000 population. Of course, you know that an exact division into districts of 1,000 is impossible. We made it as near as we could with such data as we had.

There is appointed in each district a committee of women. I do not need to go into the psychological details as to why a committee of women was appointed as better than one of men. Please accept that as a fact. The size of the

committee is more or less varied. It requires on the average one committee member for each ten or twelve families.

It seems essential to us that the little section of the district which each member of the committee had to look out for should be her own immediate neighbors.

The district committee selects its own chairman. That has worked out very well. This organization was completed last summer. The first real occasion for using it came in our big epidemic last fall.

It seemed to a great many people that there must be a lot of persons who needed financial or other assistance. The district committees were requested to investigate and turn in to headquarters the name and address of every person who needed financial or other assistance.

In forty-eight hours the work was done. There has never been a complaint on the part of anybody that anyone was overlooked in that survey. The astonishing thing was the small number of people who needed financial assistance. We had to spend only about \$500, and this was toward the end of the epidemic.

I commend that form of organization for the consideration of all.

#### THE REHABILITATION OF THE TUBERCULOUS SOLDIER.

BY CHARLES EUGENE PERRY, M.D., NORTHAMPTON, MASS.

WHEN we first think of army disabilities it is surgical conditions that come to mind, but a little further study of the situation brings out the fact that by far the greater proportion of damage done or brought to attention by the war is of a medical rather than a surgical character.

There have been rejected for tuberculosis, by the local draft boards, about 62,000; 23,000 more, who got by the draft boards, were rejected by the camp surgeons; about 5,000 have been discharged directly from the army and almost 2,500 more from the army sanatoria. There are, at this time, approximately 6,000 tuberculous soldiers under treatment in the army sanatoria in this country and perhaps a few hundred more overseas.

Early in the war the medical men of this country were startled by the reports that came from France that 86,000 soldiers had been discharged from their army on account of tuberculosis during the first year of the war. Tuberculosis workers and medical men in general were much alarmed and felt that our

armies must be gone over very thoroughly to eliminate the possibility of our soldiers who had the least sign, symptom, or even history of such disease continuing in the ranks of our army.

During the summer of 1917, Major Edouard Rist, of the French Army, reported at a meeting of military surgeons at Fort Benjamin Harrison, that the gravity of the situation in France was much less than previous reports indicated, as more than 50% of the 86,000 mentioned had already returned to duty as non-tuberculous. He said diagnoses had been made on much too slight evidence and that really temporary infections of the nose, throat and bronchi were responsible.

The United States was extremely fortunate in having a senior officer who knew well the soldier and conditions obtaining in the Army, as well as being one of the foremost authorities on tuberculosis. Col. George E. Bushnell, retired, for years in command of the Army Tuberculosis Hospital at Fort Bayard, N. M., was recalled to service by the Surgeon General's Office and placed in charge of the tuberculosis work. Colonel Bushnell believed that army life generally, where troops were well fed, was beneficial to cases of arrested tuberculosis with lesions of slight extent. He held, therefore, that the problem was to eliminate those with the manifestly active disease.

With this end in view, boards of examiners were formed of men in the medical corps and contract surgeons who were more or less experienced in the art of chest examination. These boards were characterized by Colonel Bushnell as a fair representation of the country's best skill. That these boards might do uniform work, according to the policies of the Surgeon General's Office, pamphlets of instructions were sent out and schools for tuberculosis examiners were established at Fort Benjamin Harrison and Fort Oglethorpe. I will not attempt to describe the methods used by the boards, or to express an opinion on the character of the work done, except to say that I believe the net result was as good as could be expected, allowing for the haste required.

From the first two and a half millions examined, around 22,000, or approximately six-tenths of one per cent., were found to be tuberculous. The percentage varied from  $\frac{16}{100}$  per cent. in the aviation corps to nearly  $\frac{6}{100}$  of one

per cent. in some camps. I have no figures to support my claim, but from observation the greater amount of tuberculosis evident among troops was from sections of the country where education and health laws were more backward. Up to the early part of 1918 a great majority of the tuberculosis cases discovered were discharged directly from the Army. About this time the new special hospitals for the treatment of tuberculosis began to reach completion. When these new beds became available, it became the policy of the War Department to hold all soldiers said to be tuberculous until fit to return to duty or until it was evident that no more benefit could be derived by further treatment.

General Hospital No. 16, at New Haven, was the first to open and was used as a school for officers and nurses doing tuberculosis work. It was my good fortune to be assigned to Hospital No. 8, at Otisville, N. Y., at its opening, and it is the work at this with which I am most familiar. When we first entered this new work we were all delighted with the prospect of at last treating tuberculosis under conditions which we thought to offer the best chances for cure and which were difficult to obtain in public civilian sanatoria. With men in military service, accustomed to discipline, who would be obliged to accept details of strict sanatorium treatment and remain as long as was necessary for their cure, apparently an ideal condition existed.

I soon found that we were mistaken. Men sick in hospitals were not as amenable to discipline as in the camps, and they certainly would not accept treatment consisting of rigid rules and rest, gracefully. Some insisted they were not sick and would not remain in bed; others admitted being sick, but insisted they would soon be worse if compelled to remain in that climate; a few openly refused to obey rules regarding the treatment, and when refused furloughs and passes, many were absent without leave. They complained bitterly of the food and some wrote letters home saying that they were receiving no treatment and that the food was very poor and insufficient in quantity. This caused a great deal of unrest at home and many letters were received requesting that soldiers be discharged and containing all sorts of argument to this end. Some sought the assistance of members of Congress

and state and local officials to attain their object. Many patients who, under proper conditions, would have taken treatment faithfully and well, became restive and lost confidence on account of the fault finding and criticism of the few.

These conditions of restiveness have largely been overcome by various means, each method an interesting story in itself. I will attempt to describe only one of the most efficient plans which helped accomplish the end desired.

About two months after the hospital opened there was added the reconstruction department. At first, it consisted of a captain and one second lieutenant and several enlisted men, school teachers and men who had training in army occupational work, but who had had no training in tuberculosis. Captain Mathew McCann, a former high school principal of this State, was in charge and soon made his presence felt as a leader and instructor. He cooperated closely with the medical department through a medical officer who was assigned his advisor and to whom all questions regarding therapeutic work for patients was referred. It was the object of this department to carry out all medical therapeutic exercise prescriptions; to keep the patients contented and as busy as their physical condition permitted and to deliver the men better able physically, mentally, and morally to compete with modern life after their discharge from the Army. These objects were accomplished to a wonderful degree and I believe it is a good object lesson and points a way in which our civil institutions may be greatly improved. The success of such work depends almost entirely upon the ability of the person in charge. He must be one capable and willing to grasp the medical viewpoint and follow medical prescriptions implicitly, and one also capable of making the patients realize that the work is for their own interest and not for the profit of the institution. In fact, he must be nurse, teacher, and morale officer. Few physicians I have seen possess these qualifications.

The work was started by the use of therapeutic walks only. Walks were laid out in a series of five, varying in length from two-thirds of a mile to three miles, and numbered. Men thought able, after a period of hospital rest, were assigned by their immediate medical officer to walk one, and were promoted, as their condition warranted, through the series. Men

in good condition would go through the series in two or three weeks; others would be retained on the short walks for an indefinite period. Each detachment was sent in charge of a non-commissioned officer. The speed did not exceed 90 paces per minute and the time varied from forty minutes to two hours. Resting places were assigned and periods varied from ten minutes to one-half hour. These walks were required of all thought able to undertake them and furloughs and passes, as a rule, were not issued unless a patient was able to be on walk. While at first patients were reluctant to undertake these walks faithfully and cheerfully, so much value was soon evident that the spirit was, later, excellent. It was provided that patients be dropped automatically and held on the ward for further consideration by the medical officer if the temperature was reported as high as 99 twice in seven days or 99.2 or higher at any one time. If the pulse was reported as 100 or over, a special report was sent to the medical officer for investigation. It was further provided that patients should be dropped for further investigation who lost three or more pounds in one week, two pounds in two successive weeks, or one pound in three successive weeks.

Some more teaching personnel was provided and a carpenter shop, an auto school, and a 74-acre farm were established. Men were graduated from therapeutic walks into these departments. Class work was instituted for times that did not interfere with physical reconstruction, and also for a few who were able to do light mental work, but not physical. There were classes in wireless operating, typewriting, English, arithmetic, penmanship, algebra, trigonometry, shorthand, salesmanship, law, farm management, poultry, and bee keeping. A weekly newspaper was established and has been of great assistance through its special articles and editorials, in educating patients and working force concerning tuberculosis. A Pathéscope is in use by the department and gives picture-shows nearly every night to bed patients in the wards. Many of the aliens have taken advantage of the class in naturalization.

The patients have been recently classified in three groups: Ambulatory, semi-ambulatory, and bed, and placed in separate wards. For patients in bed there is provided bedside instruction by teachers and reconstruction aides

in academic work, drawing, and various forms of handicraft. The patients work by themselves and are visited daily by the instructors, who supervise the work and offer encouragement, spending about ten minutes with each patient. This feature of the work is of inestimable value and adds much to cheer up the atmosphere, which tends to become so gloomy.

It is reported that 75% of all patients are engaged in some part of the work at Otisville, while at New Haven a report of one month's work shows 90%. An Otisville report shows that "for many months no patient has been obliged to quit any of the outside work on account of increased tuberculous activity," which shows that the work has been carefully graded according to the physical needs of the patient.

A department like this requires a large force. The one at Otisville for 700 patients has one captain, three second lieutenants, six sergeants, five corporals, fifteen privates, and about twenty-five reconstruction aides. This adds materially to the cost of treatment, but I believe practically the same work can be done with a much smaller force.

When the tuberculous soldier is discharged from the Army he is entitled to apply to the Bureau of War Risk Insurance for compensation. (Compensation has nothing to do with government insurance.)

If found compensable, he may fall in one of three classes: 1. Advanced consumptive; 2. disease active, in need of sanatorium care; 3. disease apparently arrested. At present, the amount of compensation is in accordance with the reduced earning capacity. That is, if a soldier needs care or is otherwise unable to earn anything, he is given full compensation; if later he is able to earn as much or more than he earned before entering the Army, his entire compensation is cut off. The National Tuberculosis Association has recommended that tuberculosis be classed as a "specific, permanent injury" and awarded a minimum compensation rating of 25%, so as not to penalize for individual success in overcoming a handicap.

The advanced case presents the same problem to the community as do others in civilian life, that is, they may be cared for at home, if facilities are adequate and children are not present, or they may be sent to either government or local sanatoria, preferably those near the friends and relatives.

Those with active disease, in need of sanatorium care, in which there is a fair hope of reaching a state of arrest, may be recommended by the Board to go to local sanatoria or to the Public Health Service hospitals.

When the disease is arrested, the soldier is entitled to the services of the Federal Board of Vocational Education, whose duty it is to see that work is obtained either on the old job or that he be given an opportunity of working part time until he becomes able to resume the whole-time job; or, if his old occupation is unsuitable, that he receive retraining in some new line of work.

The work of the Board cannot be too highly commended. It is making itself a clearing station for all the troubles of disabled soldiers. It advises and gives aid and counsel regarding his future welfare; helps him to obtain his compensation; even has been known to assist in fighting divorce suits and in straightening out all sorts of domestic entanglements.

At the request of this Board, a committee of eleven members has been appointed by the National Tuberculosis Association to standardize and make recommendations as to policies in regard to tuberculosis. Dr. Pattison, the medical field secretary, to whom I am indebted for a great deal of information, has been detailed to act as special investigator and secretary of the committee.

Dr. Pattison has recently published a comprehensive article on "Placing the Arrested Tuberculous on a Job"\* which has been adopted as its policy by the Federal Board of Vocational Education.

Education is still the crying need in this work, and we can all be of assistance to the soldier and to the Government by disseminating a true knowledge of the disease to the soldier, his friends and relatives with whom we are in constant contact, as well as to the public at large.

In spite of our campaigns of education, the amount of misinformation in regard to this disease among the people and also, to a great extent, among physicians, nurses, and social workers is amazing. The worn-out ideas that tuberculosis is highly infectious to adults and that its cure depends largely on removal to the Southwest, taking a large amount of milk and eggs, and exercising to the limit of one's

\* April number of the *Journal of Outdoor Life*.

strength, that weakness may not be brought on by lying in bed, that when the disease becomes arrested one must never undertake any indoor occupation, are widespread and deeply rooted.

The important factor is to impress the soldier that it is not necessary to change his residence; that he is not permanently unable to do any work; that he has a duty to perform to the country in striving to resume as near his former place as is possible; that change of occupation is not, as a rule, to be undertaken unless the former occupation is absolutely harmful in itself or its environments, and that, should he be an open case of tuberculosis, he must live apart from children.

### THE REHABILITATION OF THE TUBERCULOUS SOLDIER.

BY SEYMOUR H. STONE, BOSTON.

THE government has adopted the following slogan which, I assume, applies to the tuberculous soldier: "The physical cripple must not also become a social and economic cripple."

When a draftee or soldier is found to have tuberculosis and is sent home, the State Department of Health of his state is notified. The names of 2,020 such men have been received by the Massachusetts State Department of Health.\* This department sends these names to its district health officer, who, in turn, requests the local Board of Health, the local Tuberculosis Department, or the Anti-Tuberculosis Association, to look up the patient and see that he receives the necessary attention. This work is generally done by a nurse. In Boston, the Boston Consumptives' Hospital Department has one person who devotes her whole time to such work.

So far as treatment is concerned, we find that up to last December only twenty-five men discharged from the Army or Navy, or exempted in the draft from military duties, have been sent to the four State sanatoria, and this with no waiting list for the preceding six months, and I understand the situation has not changed much today. But a recent study made by the State Department of Health shows that there are 55 in hospitals, so 30 must be in other hospitals than the state institutions.

This study of 1512 of the men discharged

from the Army or Navy, or exempted in the draft discloses these additional facts:—

At present in their home locality ..	1060
Left their home locality .....	96
Left State .....	60
Dead .....	72
Unknown .....	68
Non-tuberculous .....	156
	— 1512

Of the 1060 in their home locality we find:—

Under medical supervision .....	356
No medical supervision .....	573
Unknown .....	131
	— 1060
In good condition .....	271
In poor condition .....	615
Condition not stated .....	174
	— 1060
Working .....	410
Not working .....	246
Not stated .....	404
	— 1060

These figures seem to indicate that more than half the number studied are in poor condition and more than half are not under medical supervision.

Here undoubtedly is need for improvement on the part of our local health organizations. We must see that these patients are examined more often, and not only this, but undoubtedly most of the patients need educating in regard to the communicability of the disease and in its curability if treatment is taken early enough. In other words, we must keep an educational campaign going all the time. Dr. Perry has strongly emphasized the need of educating the public in regard to tuberculosis.

Patients are still going to the southwest for cure, and doctors are advising them to go. Many become pitifully stranded and the southwestern states have a very serious problem in the thousands of such patients and their families who become public charges. Appeals have been made to the U. S. Government for relief from this situation, and at the present time a special representative of the National Tuberculosis Association is in the southwest, making a study of the problem. Do not let us make the mistake of advising patients without independent means of support to go west to live, in our efforts to rehabilitate the tuberculous soldier. We can take care of them at home and we ought to do so.

Dr. Perry has told you that the government tuberculosis hospitals are teaching occupations. I wish to emphasize this point and particularly the therapeutic value of such work.

\*The State Department of Health has since increased this number to 2334; 156 of these are in Boston.



One of the greatest difficulties the individual or agency that tries to rehabilitate a sanatorium patient has to overcome is the rest habit that he is rightly taught at the sanatorium. Some patients seem to think they must rest the remainder of their lives and, of course, it is exceedingly difficult for the rehabilitating agency to find a job where a patient can rest all the time and yet earn his living and also support a family. Is it not here that the sanatorium can help the situation by establishing occupational therapy? If patients, before they are discharged, are given some sort of interesting occupation, will they not fit into the busy world easier and better when they are discharged and ready for self-support? It seems to me that this policy should be also to make the patient more contented with his lot in the institution and that we ought to have fewer complaints. I know that sanatoria superintendents and boards of trustees realize this, but some of them are unable to establish work of this kind without more income or larger appropriations. We ought to help them to install such work and thus assist in making the final step in the rehabilitation of the patient easier.

What I have advocated for the tuberculous soldier I think should apply also to the citizen patient. If it is good for one it is just as good for the other. Our attention and sympathy have been drawn to the handicapped soldier because of the great war and his part in it. Why not now turn our attention and sympathy to the problem of the citizen patient, who is with us by the thousands and sorely in need of our most earnest consideration?

#### DISCUSSION.

Dr. E. O. OTIS, Boston: I understand that every man who is discharged from the demobilization camps is given a careful physical examination, and yet I am finding cases of tuberculosis: one, for instance, in the second stage, and one in the third stage, who were informed they were discharged in good condition. I wonder if the other gentlemen have had such an experience.

Secondly, I would like to ask Dr. Perry's opinion as to whether military discipline in government sanatoria is going to be satisfactory, or do the men become restless and wish to get out.

I would like to ask what the experience of the other doctors has been in regard to these points.

Dr. PERRY: I think that most of the men were examined many times during their service, and probably sometimes by an expert on tuberculosis. Some of them, of course, got by. I do not think very many; but I think on demobilization that they are not examining very thoroughly, especially if the men sign the paper and say that they are all right and that there are no symptoms of tuberculosis. The adjutant general's office is rushing to get through.

I do not believe that examination is very thorough. I know it was not in case of soldiers that I examined for discharge. There might have been some cases among them. In examining a regiment of soldiers for tuberculosis the work was done in probably from one to two or three minutes at the most for each examination.

In the physical examination we started out by asking each one to exhale; we examined the most probable places, and if we heard a r le or anything peculiar, we held the men up and looked again, and then they were gone over finally to decide whether or not they had tuberculosis.

In some regiments that claimed to have been examined we did not have records. In Camp Johnston the men said, "We were examined at Camp Gordon" or some other camp. Out of a thousand we might find one or two they had skipped, or else a history of the disease having become active since then.

Some had had typhoid vaccine. I do not believe in taking typhoid vaccine and in exercising immediately afterward. It has started up something in some soldiers' chests.

However, it seems to me that the boards got at the largest number of cases of manifest active disease as well as could be expected with hasty examination.

Dr. OTIS: If in demobilization a man is found to have active tuberculosis, can he take his choice as to whether he will go to a military sanatorium, or take war insurance and go anywhere; or, is he obliged to go to the army sanatorium?

Dr. HUNT: I might cite a case of one soldier who was discharged well. He had applied for compensation and his claim was being investigated. He had been discharged only two months previous to admittance, and being a far-advanced cavity case, I made the remark to his wife that the man probably had had tuberculosis for eight months or more. She wanted me to testify to that effect, but I managed to get out of doing it.

But, so far, the men have been referred back to the army institutions. On the point of whether a patient would be better in our institution than in the Army, our experience has been that the patients have been incorrigible. They listened neither to rhyme nor reason.

DR. PERRY: I will say that no man who has been discharged can go back to the army hospital. They must go to the marine hospital.

At the Hampshire County Sanatorium I had three soldiers who had been discharged. One was an advanced case, who died. The other two were there too short a time to make a diagnosis. I reported them to the War Risk Insurance Bureau. Another stayed five days and then said one morning that he guessed he would see the parade. He did not return. Another fellow came in and thought he would go down and see the parade. He has not got back.

These soldiers must be under military discipline or else they do as they please.

### POSTINFLUENZAL TUBERCULOSIS.

By TIMOTHY J. MURPHY, M.D., BOSTON.

*Assistant Physician, Boston Consumptives' Hospital;  
Instructor in Pulmonary Diseases, Tufts Medical  
College.*

IN the early part of the 16th century, Fracastoro, a noted Italian physician, advised the Council of Trent to change its place of meeting on account of an epidemic then prevailing throughout the European countries. He proclaimed the disease contagious, and among other wonderful tales, spoke of a leather cap which was the bearer of a contagious principle and when worn by 25 Germans in succession, caused the death of each.

Had it been possible in the early summer of 1914 to secure this mystic cap for a certain group of militaristic Germans, my tale undoubtedly would remain untold, and today this meeting of the Massachusetts Medical Society would not be vibrant with the storied horrors of our recent influenza pandemic.

Undoubtedly the immense gathering of troops, living and dying under conditions exacted by the great World War, was the active agent in weaving into the world's life the material of one of the worst, if not the worst, plagues that history has been compelled to record.

Though the running attack of influenza was quite exacting in its toll of death, what indemnities will it demand of the living—those whom it touched in the passing—what fate awaits them?

When the influenza epidemic dropped over the peak, and the first siege was drawing to a close in late October, the question of postinfluen-

zal tuberculosis assumed shape for serious medical discussion.

Now, what do we mean by postinfluenzal tuberculosis?

Naegeli showed that upon autopsy at least 99% of persons at the age of 30 harbor a focus of tuberculosis.<sup>1</sup>

In Switzerland, Reinhardt demonstrated in a series of 360 consecutive autopsies that 96% were tuberculous.<sup>1</sup>

In New York, 1,320 autopsies in children under five showed 13.5% with more or less generalized tuberculosis.<sup>1</sup>

Knopf, in his analysis, contends that from 80 to 90% seem to have contracted the disease before the fourteenth year.<sup>2</sup>

These quotations give abundant proof of the extent of tuberculous infection in the human race. Acting on this evidence, we would define postinfluenzal tuberculosis as a reactivation of an old tuberculous focus, following a more or less severe attack of influenza.

The recent pandemic of influenza did not materially differ from those which swept over Europe and America in 1793, 1833, 1847, and 1889-90.

These, though variously styled as ague, influenza, and gripe, mainly attacked the respiratory system, differed very little from the so-called Spanish influenza, and undoubtedly had the same bacterial analogy. Although the system of keeping mortality statistics in 1833 and 1847 had not approached the state of perfection which I hope exists today, nevertheless, Hoffman has compiled some definite data<sup>3</sup> regarding the mortality of New York (Manhattan and Bronx), Philadelphia, and Boston from tuberculosis of the lungs.

In 1833 the mortality rate was 434.6 per 100,000. In 1834, immediately following the epidemic, the rate jumped to 452. per 100,000, while the following year, 1835, it dropped to 416.8.

The epidemic of 1847 was evidently a more severe type. We find in that year, a death rate of 360.6 per 100,000, whereas the year before, 1846, it was 342.1. For 1848 it was 352, and 1849, 360.5 per 100,000, and did not strike its normal trend until 1850, when the rate was 321.8 per 100,000.

Hoffman, in his statistics of mortality from tuberculosis of the lungs in American cities, from 1888 to 1893—one year before, and for

three years following the grippe epidemic of 1889-90,—gives the following:

YEAR	RATE PER 100,000 FOR AMERICAN CITIES	RATE PER 100,000 FOR BOSTON
1888.....	296.....	345.....
1889.....	252.....	328.....
1890.....	202.....	333.4.....
1891.....	245.....	295.3.....
1892.....	238.....	302.6.....
1893.....	235.....	286.....

As the figures would indicate, the mortality rate in Boston was much higher than the average of all American cities in the aggregate. From 1888 to 1893, inclusive, it averaged 65.2 per 100,000 more annually. Tuberculosis was not a reportable disease in Boston until 1907, and the higher rate of mortality might be ascribed to two causes: First, climatic conditions in Boston and vicinity were possibly more favorable for tuberculosis; and secondly, physicians of Massachusetts were more keen in diagnosis of tuberculous conditions.

Obviously, from these statistics, we fail to find any material increase in the incidence of tuberculosis following these epidemics. True, there were 18 more deaths per 100,000 following the influenza of 1833 and 1847. The increase was so small it may be considered negligible.

But what about the recent pandemic?

Here we labor under some disadvantages. Too little time has elapsed for a complete and searching study of its effect on the incidence of tuberculosis, yet we are able to pick a few straws to show the direction of the wind.

By grouping the months from October 1 to May 1 for the years 1914-15 to 1918-19, and listing the cases and deaths from tuberculosis over that period in Boston alone, we obtain the following data:

#### CASES AND DEATHS FROM TUBERCULOSIS IN BOSTON.

YEAR (OCT. 1 TO MAY 1)	CASES REPORTED	DEATHS REPORTED
1914-15.....	1491.....	661.....
1915-16.....	1416.....	597.....
1916-17.....	1424.....	643.....
1917-18.....	1590.....	726.....
1918-19.....	1423.....	643.....

These figures, too, offer very little evidence of an increase in the number of cases of tuberculosis following influenza.

Perhaps the many pulmonary conditions resulting from influenza prevent us thus early from arriving at the right diagnosis.

Stengle<sup>4</sup> says the number of cases of pul-

monary residua with dubious physical signs will make the diagnosis of pulmonary tuberculosis in the absence of discovered bacilli more questionable than before the epidemic made its appearance.

Landis,<sup>5</sup> on the difficulties to be encountered in diagnosis, says that persistent and slowly resolving patches of influenza pneumonia (especially at the apex) are going to be mistaken for tuberculosis. Secondly, that known cases of tuberculosis after an attack of influenza are going to offer considerable difficulty as to whether the increase in physical signs is due to extension of the tuberculous process, or a slowly resolving influenza pneumonia which is clearing up.

But let us study the question of postinfluenzal tuberculosis from another angle. How did the tuberculous group fare with influenza?

In Framingham, where a reasonably careful analysis was made, Armstrong<sup>6</sup> states that 16% of the entire population was infected during the first epidemic, whereas only 4% of the tuberculous group was infected. Furthermore, most of these tuberculous cases were of the arrested type, taking part in the activities of every-day life of the normal population. Excluding active cases under treatment at home, Armstrong figures the incidence of influenza in the tuberculous at 2%.

Goldberg,<sup>7</sup> in a classification of 1,551 hospitalized patients in Chicago with pulmonary tuberculosis, says 85 were infected with influenza. This is an incidence of 5.4%, whereas in Camp Sherman an incidence of 33% was reported by Friedlander, McCord, and Wheeler.

At the Municipal Tuberculosis Sanitarium of Chicago, in 587 active pulmonary tuberculous cases, an incidence of 6% of influenza was noted.

In a survey of the out-patient department of the same institution where approximately 8,500 cases of pulmonary tuberculosis were under supervision, only 51 cases of complicating influenza were found during the epidemic, an incidence of .6%.

Haaves,<sup>8</sup> in a review of reports from the superintendents of State tuberculosis sanatoria of Massachusetts, states that an acute attack of influenza, usually associated with bronchopneumonia, of a greater or less severity, has had remarkably little effect on the already ex-

isting tuberculous process as far as increasing its spread or its activity is concerned.

In the Homan Sanatorium, El Paso, only three of 75 patients had influenza, while eight of 35 employees were infected.<sup>9</sup>

In May of this year, through the kindness of Dr. Hawes, I sent to the superintendents of the State tuberculosis sanatoria the following questionnaire:

1. How many cases of tuberculosis were admitted to your institution from October 1, 1918, to May 1, 1919?

2. Of the cases admitted, how many gave a history of influenza (1918-19 pandemic)?

3. How many gave a history of influenza and pneumonia?

4. Of group 2 and 3, how many show a negative tubercular history antedating the influenza infection?

From the answers to this questionnaire, the case records of the Boston Consumptives' Hospital, and the 12th Annual Report of the Massachusetts Hospitals for Consumptives, I made the following chart:

	RUTLAND	WESTFIELD	N. READING	MATTAPAN
Admissions	293	110	185	372
Cases with previous influenza	79	35	38	40
Cases with neg. t. b. history before influenza	39	19	11	15
Incidence of influenza in all cases	26.9%	31.8%	20.5%	10.7%
Incidence of influenza in cases previously t. b.	13.6%	14.6%	14.6%	6.7%
Incidence of influenza in cases previously neg.	13.3%	17.2%	5.9%	4%
Incidence in patients (during epidemic)	18.3%	17.3%	4.6%	2.5%
Incidence in employees (during epidemic)	21.3%	6.7%	10%	10%

This chart reveals many interesting conditions. The cases admitted to Rutland, Westfield, and North Reading are of the early type. In Rutland, the so-called incipient case obviously predominates. At Westfield, children outnumber the adults. Therefore cases of glandular tuberculosis are more numerous. At North Reading the cases admitted are somewhat more advanced than those received at Rutland, while at Mattapan all cases are of the advanced type, excepting those sent to the cottage wards, awaiting transfer to Rutland, Westfield, or North Reading.

The incidence of influenza in the cases sent to these last three sanatoria—Rutland, Westfield, and North Reading—as indicated by the chart, ranged from 20.5% to 31.8%, whereas at Mattapan the incidence was 10.7%.

There seems, therefore, to be no escape from the conclusion that early tuberculosis is more susceptible to influenzal infection than the far-advanced case.

Bacteriological findings show that the pneumococcus, staphylococcus, and micrococcus catarrhalis are the predominating organisms in influenza. The same mixed infection of the respiratory tract accompanies pulmonary tuberculosis. The longer contact with the organisms exists, the greater immunity is conferred. Our experience at Mattapan apparently confirms this opinion. Conversely, there is less immunity when the inflammatory process is comparatively recent. The higher incidence of influenza in tuberculous cases admitted to Rutland, Westfield, and North Reading may be attributed to this factor.

Excluding tuberculosis of the joints, bones, and meninges, Fishberg<sup>10</sup> says that the bulk of tuberculous morbidity is caused by the glands, especially the cervical and intrathoracic.

In our children's ward at Mattapan, tuberculosis of the tracheo-bronchial and cervical glands are the most prevalent. We find very few active pulmonary cases among the children, and influenza swept through the wards like measles.

Goldberg cites the same condition in 154 glandular tuberculous cases in the Municipal Tuberculosis Sanatorium of Chicago, where the incidence was 46.2%.

No doubt this high incidence of influenza at Westfield, where the children are in the majority, may be due to the prevalence of glandular tuberculosis.

Of the 40 adult cases admitted to the Boston Consumptives' Hospital, with a previous history of influenza, 32 had far-advanced disease and sputum positive.

In the eight with sputum negative, one had been at Rutland six years ago and discharged arrested; one had empyema, one asthma, one chronic interstitial nephritis, one resolving pneumonia at apex, one a cardiac with a bilateral effusion, and two showed chronic non-tubercular pulmonary symptoms with signs at the bases,—no temperature, and negative x-ray findings.

There were 15 cases which gave a negative history of tuberculosis antedating this attack of influenza, yet each showed advanced signs with cavity formation.

This may seem an anomaly, but on going over case records for several years past, we find about 37.5% of our cases deny a tubercular history up to five months before admission.

During the epidemic there was an influenza incidence of 2.5% in the patients, whereas 10% of the employees were infected. None of the employees had tuberculosis, and examination three months afterwards revealed a negative condition.

The low incidence of 2.5% among patients seems to add further proof to the contention that a low grade inflammatory process of the respiratory tract confers a marked degree of immunity against a frank invasion of influenza.

In those sanatoria where the disease is mild or of early type, and where there is a shorter period of contact with the organisms of mixed infection, the incidence runs higher.

Witness the figures—Mattapan has 2.5% incidence; North Reading, 4.6%; Westfield, 17.3%; and Rutland, 18.3%.

Among the employees of three institutions the incidence runs from 7 to 10%, while at Rutland it is 21.3%.

Clinical observations in the Army and Navy during the epidemic, indicate the high rate of morbidity and mortality in a group of individuals considered of a healthy and robust type.

In Camp Sherman alone there was an influenza incidence of 33% among the troops.

From Camp Cody, Deming, N. Y., Lamb and Brannin report an incidence of 29%.

At Camp Pike, Ark., there were 11,725 cases<sup>10</sup> between September 20 and October 14—a percentage of 23.3 reported by Opie, Freeman, Small, and Rivers.<sup>11</sup>

From this brief study of the effect of influenza on the incidence of tuberculosis, I have drawn the following conclusions:

#### CONCLUSIONS.

1. That epidemics of influenza are not followed by any measurable increase in the incidence of tuberculosis.

2. That in people with mild or arrested tuberculosis a higher incidence of influenza is evident than in those with the advanced type.

3. That in people with active tuberculosis a certain degree of immunity is produced by the constant presence of a low grade chronic inflammatory process of the respiratory tract, which protects them to some extent against a frank invasion of influenza.

4. That cases of glandular tuberculosis, especially the cervical and tracheo-bronchial type of children, show a very high incidence of influenza, but very few frank cases of pulmonary tuberculosis follow.

5. Individuals in the prime of life, apparently free from physical defects and previous history of illness, are more susceptible to influenza.

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- <sup>3</sup> National Tuberculosis Association Report, 1913, pp. 130, 131.
- <sup>4</sup> Clinics of North America, No. 3, November, 1915.
- <sup>5</sup> *Ibid.*
- <sup>6</sup> BOSTON MEDICAL AND SURGICAL JOURNAL, Jan. 16, 1919, Vol. clxxx, No. 3, pp. 65-67.
- <sup>7</sup> Chicago Bulletin, December, 1918, Vol. i, No. 9.
- <sup>8</sup> BOSTON MEDICAL AND SURGICAL JOURNAL, January 9, 1919, Vol. clxxx, No. 2, p. 35.
- <sup>9</sup> Southwest Med., R. B. Homan, November, 1918, No. 11, p. 15.
- <sup>10</sup> Journal A. M. A., Vol. lxxii, No. 15, April 12, 1919.
- <sup>11</sup> Journal A. M. A., Vol. lxxii, No. 8, Feb. 22, 1919.

#### DISCUSSION

DR. F. R. HUNT, Boston: Dr. Murphy's paper presents statistics against theory. Since I have been working in tuberculosis at least, I have always accepted the theory that following influenza a great amount of tuberculosis could be expected. (Looking at the chart.) During the epidemic of 1889, and the two succeeding years, between 30 and 40 per cent. of the population were stricken with influenza. Subsequent mortality reports certainly show no serious tuberculosis problem as connected directly with influenza.

What we can get out of the last epidemic, as Dr. Murphy explained, is that there is a decided comparative immunity in those who have definite active tuberculosis.

The next thing of importance, I think, is in regard to those cases of tuberculosis that did have influenza. When these patients, positive sputum cases with definite lesions, whether an apex, a whole lobe, or a much greater involvement, had influenza they made a very good recovery, or as in the case of the non-tuberculous, they either had influenza and got over it, or there was a subsequent pneumonia with a fair proportion of deaths.

In those that recovered, as far as I have been able to see, no appreciable effect on the old tuberculous process has resulted.

The old theory, I think, that we have been acting on, will have to be discarded. The tendency will be to replace it with a new one,

and we will hear more often of not new cases, but reactivated, old, or healed tuberculosis.

As Dr. Armstrong says, if there are quite as many as one million active cases of tuberculosis in the United States, there are one million more of the old or arrested cases. Where we got 16 per cent. of these people coming down with influenza, we ought to expect a higher incidence of tuberculosis, if we believe that influenza reactivates these old cured lesions, and we do not, according to our previous statistics.

I think that there are two pregnant sources of error, one being in history taking, the other in calling an active clinical tuberculosis influenza. I do not criticize the man who is giving or taking the history. We know that in tuberculosis work the patient's previous history is almost impossible to get, especially when we attempt to go back more than a few months.

In our far advanced cases about 15 out of 40 say they were perfectly well up to the time their tuberculosis was discovered. A great many of these are old cavity cases, and we know that those do not form over night or in a few months, although we bear in mind the fulminating types, knowing that they are comparatively infrequent.

We know that men come through physical examinations very often and are pronounced negative cases. During the recent epidemic every one was busy, some men claiming to make as many as 60 or 80 visits a day. Everyone was pressed for time and, in many cases, a chest examination was not made.

If the physician thought about a possible tuberculosis, a definite tuberculosis diagnosis was a different thing to make. I am quite sure that some of the cases reported as influenza were really cases of active tuberculosis, not a reactivity of a healed process, but an acute exacerbation of an already active process. One illustration to impress the inaccuracy of history taking and hasty influenza diagnosis. One of our patients at Mattapan came to me in April, 1918, and said, "Doctor, I want to go home." He was feeling pretty fit, and weighed 160 pounds, and he wanted to go to work. I examined him and found trouble in his right upper and left apex. He was a positive sputum case. I advised him not to go. He left the institution. About a week later, I heard that he had joined the Navy, and last November I saw him in uniform. He was at that time visiting one of our patients.

I asked him how long he had been in the Navy, and he said since he had left the institution.

"How have you made out?" I asked him.

He said, "Well, I had influenza last September, was sent to a hospital, stayed there ten days, was discharged back to the navy yard, but had a relapse. Am back again in the Navy, but am doing only light work."

While on his visit, I had four students go over his chest. They easily discovered the tuberculosis lesions. I got the hospital report on him. From it, I found that he was admitted with influenza, with some signs of his right base. Ten days later he was discharged with no signs in his chest. His sputum had not been examined. I think this happens more frequently than we like to think.

This is the kind of case we attribute very often to influenza. If we could get a definite record of more of this kind of case, we would talk less of particular positive contributory agents in tuberculosis.

## Original Articles.

### RADIOTHERAPY.\*

BY FREDERICK BRYANT, M.D., WORCESTER, MASS.

IN presenting this article it is my purpose to discuss the history of the discovery, the peculiar properties, and the therapeutic use of radioactive substances, as are represented by radium and those extreme electric radiations, as are represented by the roentgen ray. I hope to be able to bring to the physician, who has neither the time nor the opportunity minutely to study these agencies, a dependable estimation of their true worth and the class of cases in which they may be employed with reasonable expectation of results and strongly to urge their acceptance, in a coöperative way, by the surgeon that the work of his hand may have more permanency or cure.

The roentgen ray came as the befitting climax of a wonderful line of brilliant electrical discoveries antedating the Christian era, and participated in by fearless, self-sacrificing mastermen of inventive genius. We cannot pass the names of Dodd and Holzknecht unmentioned. They were our great pioneer roentgenologists. Unprotected and heedless of the warnings of danger, they studied the new radiation with relentless energy, and although wounded and bleeding, like true soldiers, they never faltered, but rushed ahead in the siege and conquest for knowledge until they themselves fell, burned by the very light they would perfect to heal others. They healed others, themselves they could not heal.

In 1895 William Conrad Roentgen was re-

\* Read before the Thurber Medical Society of Milford, Mass., April 2, 1919.

producing some experiments which had been published by Leonard in 1892, in which he claimed that the cathode rays could be observed outside the vacuum tube: that they possessed the ability to pass through opaque substances and excite fluorescence in crystals of bario-platino-cyanide. He was unconsciously producing x-rays. He and his late instructor, Hertz, should have received the well-merited honor of this most potent discovery of all ages. On that eventful day Roentgen made use of other men's inventions. He was exciting a vacuum tube perfected by Sir William Crooks, in 1878, using an induction coil invented by Michael Faraday in 1831, when, almost by accident, he discovered the all-penetrating rays.

Roentgen must, however, be credited with one step forward in this discovery, for he covered the vacuum tube tightly with thick black cardboard through which no light could pass. All was absolute darkness, but when he excited the covered tube, a piece of cardboard coated with bario-platino-cyanide, on a table near by, lighted brilliantly. He realized he was dealing with something new—a form of radiation which penetrated opaque substances.

No discovery ever produced such a profound effect. The little town of Wurzburg, high among the Bavarian hills, became the center of universal interest and thought. The news flashed over the scientific world and in an incredibly short period of time men of science, everywhere, began to produce, experiment with, and improve upon the wonderful rays.<sup>1</sup> Nor has the interest ever lagged or halted for one improvement has rapidly followed upon another, till, today, we find that it has not only become one of the most dependable and necessary adjuncts to clinical and surgical diagnosis, but is itself a therapeutic agent of increasing value.

But this was not all. The great discovery, visibly affected all previous conceptions of matter and force. It yielded a new knowledge of radiation and radioactivity. It resulted in a subdivision of the atom which had previously been considered the ultimate division of matter. It established the conception that the atom is again subdivided into electrons and finally brought us to the irresistible conclusion that all matter has an electrical basis for ultimate composition. And still again, this great discovery unquestionably paved the way for the next astounding discovery of the 19th century—radium.

While necessity may be the mother of invention, certainly accident is a close relative. In the discovery of the "wonder metal" chance again played its helpful part, and its real discoverer, like the real discoverer of roentgen rays, received little or no credit. In 1898, three years after Roentgen had startled the world with his almost incredible announcement, Mme. Curie caused almost as great scientific commotion by her claim that she had extracted and isolated a new metal which possessed radiant power akin to roentgen rays. She claimed for this new metal two million times more radiant energy than that possessed by any other metal. Mme. Curie's statements would have been discredited had not the knowledge of the roentgen rays prepared the way for the ready acceptance of this twin discovery.

Radioactivity of metals was discovered in 1896 by an eminent French physicist, Henry Becquerel, who believed that there were fluorescent substances in nature which might give off radiations similar to roentgen rays. He was testing with a photographic plate the amount of fluorescence to be obtained from uranium under the influence of the sun. When the day became cloudy the plate was placed in a drawer and the salt thrown in over it. Later this plate was developed and, to Becquerel's surprise, it had been strikingly affected. He had discovered a new property of matter. He believed it was possible to produce a pocket edition of the x-ray tube. But Becquerel was a physicist unacquainted with the close chemical qualities and combinations of metals. He had discovered something but he was unable to procure it.

At this time Mme. Curie, an eminent chemist, was investigating the radioactivity of metals. Assisted by her husband, she devoted two years in an attempt to isolate the source of this mysterious radiation. In a pitchblend from St. Joachimsthal, in Bavaria, she finally separated a minute residue which possessed an astounding radioactivity transcending all other metals by millions. To this new element she gave the befitting name of radium. It possesses the peculiar and striking property of spontaneously emitting radiations which are capable of passing through metals and other opaque bodies.

The great scarcity and difficulty in obtaining radium accounts for its great market value. The world now looks to America for this almost priceless metal. To ultimately produce one gram requires the mining of 500 tons of

crude canotite ore. This is the most abundant radium-containing ore in the world. It is found in the Paradox Valley, in Colorado and Utah. It has recently been claimed that this ore can be found in a continuous line 150 miles long by five miles wide.<sup>2</sup>

This ore is the rim rock of the canyon. It is therefore necessary to transport it down into the valley on the backs of mules, and again out of the valley by teams, till the railroad is reached. In the milling and chemical process which this ore now receives, another 500 tons of chemicals, water and coal included, are added. It is the most drastic chemical process known to science. The extract is so very minute that the entire process is exceedingly exacting and strenuous. The end product, like Biblical mustard seed, is the tiniest of all objects and one hundred times more precious than a diamond.

Radium possesses radioactivity "par excellence." It is a property of the atom. It is due to disintegration. Each atom is stable until it undergoes a sort of explosion which changes it to a different chemical element. This disintegration is attended with an evolution of energy greater, by far, than any known chemical reaction. Why certain atoms remain stable for thousands of years and others for billions of years is one of nature's profoundest mysteries.

The amount of energy spontaneously given off by radium is simply astonishing and almost beyond belief. How a substance can give out such a tremendous amount of energy when it receives nothing, from any ordinary source, is a mineral mystery and richly entitles radium to the proud distinction of being the wonder metal, for of all metals radium most closely resembles a living thing. These radioactive changes go on continuously with absolute law and precision, utterly uninfluenced by external conditions.

The radio output of radium comprises three distinct varieties of rays which have different velocities and different degrees of penetration. These rays, generally speaking, leave the mother metal with the velocity of light. The alpha ray is the first to come and is very weak in comparison. The next is the beta ray, which compares with the cathode stream of the roentgen ray tube. This ray must be taken into serious consideration and filtered out, for it is burning in its nature. The last, the gamma ray, is the

most penetrating of them all, and is even more so than the roentgen ray, although the quantity is less. As the result of actual demonstration these gamma rays have been found to be able to penetrate a foot of solid iron.

Each radioactive substance has its period of life in striking similarity to the vegetable and animal world. The time required for one-half disintegration is called the half period. For radium this is seventeen hundred years, and one-half the remainder in seventeen hundred years more, and so on, almost countless time. For uranium the half period is five billion years.

While these rare earths are extremely scarce, yet radioactive substances occur in extremely small amounts almost everywhere. They are present in almost all rocks; they are found in soils and springs; and their activity in the ocean is enormous. They also have an atmospheric activity. It is a matter of wide demonstration that radio active waters exert a decidedly stimulating effect on plant life.

Radium salts are continuously giving off heat in sufficient quantity to keep the salt several degrees warmer than the surroundings. In one hour one gram gives off 134 calories. It is claimed that there is sufficient radium in the earth to maintain its present heat. There has been much speculation among physicists, as to the possibility of the heavenly bodies deriving their illuminosity from radioactive elements. It is thought quite possible that radioactivity may help to maintain the sun's heat.

The question suggests itself why this disintegration transformation has not completed itself to the utter decomposition of radium. But radium is not an end product. It is only one stage of a great mineral evolution. Uranium appears to be the parent radio-element of the whole radium series. Radium is a disintegration product of ionium, while radium in turn disintegrates into another radio-element, and so on in endless change; for, who can tell the age of the hills?

In time it became apparent that the radium rays produced a pronounced effect on living tissues. This was first observed when radium was left too long in contact or near the body; it would produce severe burns. This, in time, led to the use of radium in the treatment of diseased tissues. It now occupies a prominent and substantial place in the treatment of skin and



uterine diseases, malignant and non-malignant growths.

In the medical world there is a wide difference of opinion regarding the actual worth of radiotherapy. At the time of these great discoveries the public in general, and to a more limited degree medical men themselves, became intoxicated with exaggerated hopes of wondrous cures. The pendulum of public opinion swung far to this side. Ignorance of the nature of the rays and inexperience in their use resulted, as could only be expected, in faulty and unskilled methods, disastrous and excruciating burns, with beneficial results few and far between. Brave investigators, determined to find the true nature of the roentgen ray, unprotected and long exposed, fell victims to its unknown powers. Radium was extremely scarce and expensive and difficult to obtain. Being a metal it has been fully understood only by chemists and physicists, who had little knowledge of its medical use. From a lack of knowledge of the true nature of this mysterious metal of gigantic power, physicians and surgeons have been fearful of its use. As a result of all this study and heroic sacrifice, experimentation and investigation, brilliant results and dire failure, the pendulum of medical opinion is swinging back to a proper estimation of radiation worth.

We believe that we are now approaching the truth in this important matter. We believe we are beginning to understand the action of these subtle rays on tissue and the technique of their use and application to disease. And although the time is short we have been able to observe and to tabulate results and to compare experiences and standardize technique till we have reached the position of understanding where it is possible, with reasonable assurance, to indicate to the physician and surgeon the true value and limitations of the new radiations. In the concluding pages I shall endeavor to point out these uses and enter an earnest plea that medical men make use of these agencies whenever definitely indicated, to the end that in this wise selection we may bring the greatest amount of relief and cure to suffering humanity.

The roentgen rays and radium exert a very similar action on normal and diseased tissue. The cancer cell is a weakling and less resistant than the normal structures. It requires only

one-half the amount of radiant energy utterly to destroy it that it requires to prostrate the healthy cell. The cancer tissue is embryonic in structure and becomes an easy prey to radiation if it is accessible and young, or at that stage when the nucleus of the evil cell is undergoing subdivision or procreation. When properly applied and in sufficient doses these radiations act destructively first on the nucleus, then on the body of the cancer cell. At the same time the rays act directly in definitely stimulating a growth of connective tissue which takes the place of the cancer mass. Some argue that the rays do not act on the cancer cell directly in accomplishing its destruction, but that by stimulating a proliferation of connective tissue they bring pressure on blood supply of the cancerous cells and "choke them off." The marked and almost immediate effects of profound radiation which can be observed seem to be too sudden to be produced by connective tissue proliferation, which is a very slow process. Again, others claim that the best and most reasonable explanation of this destructive action is found in the action of the rays directly on the circulation or blood supply of the growth. This arterial degeneration seems most plausible, especially so in the case of radium.

"I am convinced that in the treatment of cancer no single method is satisfactory. We get the greatest number of people well by combining all the agencies at hand. I refer to electro-coagulation, radium, roentgen rays, and surgery."<sup>73</sup> Electro-coagulation removes or destroys all the cancer growth from the surface and allows the radiations free and close application to any cancer cells remaining in the deeper tissues and avoids the surgical danger of letting the evil cells loose into the lymphatics and blood vessels. Whenever possible, radium and the roentgen rays should be combined in a routine way. The radium applicator is adapted to the deep cavities of the body, where it acts from point and close contact, or may be actually buried in the growth. On the other hand, the roentgen ray is much more suitable when large surface areas are to be radiated and for the scouting of metastases. In this combination we are able to cross-fire the malignant mass from within and from without and bring the greatest amount of radiation to bear on the culprit tissue.

In this judicious selection and wise combination, surgery occupies an important and indispensable place. The radio-therapist in no way seeks to displace the surgeon but rather to aid and cooperate with him, believing that in this combination rests the only hope for the future in battling this, as yet, most unconquerable foe of our race. The surgeon realizes that, unassisted, he cannot hope to improve upon the present frightful situation. He has perfected his technic and has labored long and well only to realize that the dread monster increases his ravages. He hesitates more and more to incise the malignant mass, for he has learned that unless he can remove all the malignant cells he only converts a local into a general disease and hastens rather than retards the evil end. He desperately needs some agency to control the metastases and render the cancer cells less malignant. Radiation, we believe, offers him the only solution.

This cooperation has been extensively entered into in the large foreign clinics in malignant conditions and is coming into rapidly increasing use in our own great medical centers. The following is, in a general way, the method employed. If the case is operable, in some clinics, radiations are employed just previous to the operation, including the mass and along all the lines of metastasis leading out. In other clinics the diseased area is cauterized, but all agree to radiations following the operation along the wound and along all the avenues of escape of the bandit cells.<sup>1</sup> The patient is impressed with the importance of returning for examination and re-treatment, if found necessary, for a few cells may be left and remain dormant for many years. The danger, therefore, is in too little rather than too much radiation. If this method is strictly adhered to, and the cases are well in the operable class, from 50 to 75 per cent. can be kept from recurrence.

When the case is inoperable or malignancy has returned, radiation offers the only hope of relief from the agonizing pain, nauseous stench, and bleeding, or permanent cure. In the forlorn group of cases radiation has, admittedly, accomplished its most brilliant results. These pained, foul, bleeding, and abandoned outcasts, avoided and shunned, like the leper, are the most pitiable derelicts of our race. When these cases receive profound radiation, a transformation, akin to miracle, takes place. The pain

ceases, the hemorrhage stops, the ulcerations dry up and heal over, the foul offensive odor disappears, the general health improves and the poor sufferer, who had but a few months of miserable, painful existence left, is granted a new lease of comfortable life, varying from one to five years; and a few inseparable cases (6.7 per cent.) have been reclaimed to operability.<sup>2</sup>

The use of radiation in gastric malignancy is of very questionable value. Here it has been impossible to secure a point contact, although many devices have been elaborated for the purpose. Roentgen rays through the abdominal wall seem unable to reach deep enough into the growth to destroy the malignant tissue. The only hope, in this critical situation, is a roentgen diagnosis, sufficiently early, to enable the surgeon radically to remove the growth.

In malignancy of the bladder and rectum the same difficulty of application prevails, but not so unsurmountable. Several ingenious applicators have been devised to establish point contact by introducing the radium through the urethra and pressing it firmly against the malignant mass, under the guidance of the cystoscope. This form of treatment has resulted in the relief of distressing symptoms, the prolonging of life, and in a small percentage, ultimate recovery.<sup>16</sup>

Herbst advocates the treatment of cancer of the prostate by exposing the tumor from above and below and inserting multiple needles containing radium for a time of full dosage. They are then removed and the wound closed.<sup>4</sup> In this radio-surgical combination the malignant growth is destroyed without shock or damage to the surrounding tissues. This same principle has been applied to malignant growths in other parts of the bladder. In this combination radiation becomes the true and useful helpmate of the surgeon.

Radiation has come into considerable use in the removal of small epitheliomas of the mouth, face, and eyelids. This is due to the fact that it is not only very dependable, but because of the little evidence of the growth which remains in the way of unsightly scars. For other facial disfiguring blemishes such as naevi and port-wine marks, it is the only satisfactory remedy.

In gynecological practice radiation has a limited but decidedly valuable application. In troublesome hemorrhagic complications it acts most beneficially in four classes of cases. Let

them be divided as follows: the woman who, young in her menstrual life, flows much too freely; the woman in mid-menstrual life who does likewise and from long standing suffers from pain, anemia, debilitation, and neurasthenia; the woman at or near the climacteric; and lastly, the woman flowing excessively from a small fibroid.

In all these cases the surgeon dreads to remove the uterus, not only because it deprives the patient of the supreme function of maternity, but the fact that almost all have suffered long and severely, renders the major operation a serious undertaking as to immediate danger, and more remotely as to chronic invalidism.

In the case of the woman young in her menstrual life, small doses of radium can be administered, at long intervals and in such a studied manner as to check but not stop the menstrual function. The same treatment applies to the woman in mid-menstrual life. The attending backache, debility and neurasthenia improve from the saving of blood. When the woman is at or near the end of her menstrual zone the radium treatment can be pushed to the entire termination of the menses, for which she can have no further use.<sup>6</sup> It should be added that cases are on record where amenorrhea has been produced by radium, but subsequently the patient has become pregnant.

In the case of bleeding fibroids, with no complications, radium is safely employed if the fibroid is not too large. "In cases associated with pain, in which the fibroid is complicated with inflammatory or other associated lesions, an abdominal operation is preferable to the use of radium." "In a well-chosen case of fibroid, however, radiation is the treatment of choice, because it is simple, almost free from danger, and is most effective in permanently relieving symptoms and ultimately diminishing the size of the fibroid."<sup>7</sup>

In this limited group of cases radiation solves some of the knottiest problems which confront the surgeon. In all inoperable or border-line conditions there is much to recommend radiative therapy. Radium can be applied in the patient's home. An anesthetic is not always required in placing it in the uterine cavity. The watery discharge which follows the occasional nausea soon disappears. Radiations are not painful, neither do

they necessarily interfere with the patient's occupation. There is no shock or operative mortality. It is safe, no matter what the heart, lung, or kidney condition may be.

The action of radiation on goitre is dependable on the fact that glandular tissue being more highly organized than connective tissue is more easily destroyed by this agency. Very favorable reports are at hand to the effect of radiation upon the general symptomatology, but in the reducing of the disfigurement all goitres do not respond alike. Cystic varieties and those composed of a large amount of fibrous tissue are least influenced. In some of our large clinics a certain number of routine radiation treatments are given.<sup>9</sup> When it becomes evident that the retrogression is insufficient, surgical removal is resorted to. The advantages of this procedure are as follows: no fatalities as the result of treatment, no matter how serious the conditions; no resulting scar; the occupation is uninterfered with; it is painless; it is the treatment of choice if an operation is contra-indicated; if unsuccessful, an operation can be performed with less danger, as the effect of the radiation is to reduce toxicity and check the growth.

It has been demonstrated that radium, when administered internally, is of value in certain chronic diseases which are little affected by other remedies. It has been administered as a radioactive water or in the form of a salt injected directly into the tissues. It seems to deserve first place for its decided and prolonged reduction of blood pressure.<sup>11</sup> It has seen considerable service in chronic arthritis. In severe anemias it serves to increase rapidly the number of red blood corpuscles. It promotes the secretions and quickens metabolism. These facts account for its rapid tonic effect.

No other agency produces so marked an impression on keloid elevations. They literally melt away from radium applications. In this connection radium has been used in war surgery to loosen up tendons and nerves tied down by extensive cicatrices. It has also found a use in stimulating atonic wound granulations and chronic fistula openings.<sup>12,13</sup>

Among other uses of radiation of minor importance may be mentioned intractable and extensive ulcerations of the cervix, a variety of chronic skin lesions which resist other forms of medication, cataracts,<sup>16</sup> and tubercular skin

and gland affections. In the group of incurable diseases of the lymphatics, radiation offers the only palliative remedy. The white count diminishes, the size of the spleen is reduced, and the glands frequently disappear. As often as they return the remedy may be effectually repeated.

From this résumé of the uses of radiotherapy it would seem to be a remedy of great usefulness, as its indications, for the most part, are where all other medicaments have failed. Relegated to the last call, is it not a wonder that it has accomplished very much at all? Is it not creditable that it has been able to hold even this rear-guard position all along the uncertain years of experimentation, of belittlement, and of condemnation? And finally, is it not a conquering acknowledgment, a transcendent testimony, a clear verdict of justification, when all the large progressive clinics the world over are making use of it in a limited but definite group of our most distressing and hopeless diseases?

It has been the earnest desire of the writer to remove radiotherapy from the vain-glorious pedestal of a cure-all and rescue it from the undeserving slough of a cure-nothing, and give to its credit that which it has and can reasonably be expected to accomplish. Let it then be very conservatively employed only along the lines indicated after a most thorough examination and accurate diagnosis. If this admonition is heeded and the radiations are applied in keeping with the dictates of skilled experience, dependable results will obtain in a realm of greatest suffering and despair.

The students of radiotherapy are eager to bring its powers into successful perfection, disclaiming all unwarranted abilities or possibilities. They appeal to the medical profession to accept, with open, fair, and unbiased minds, their coöperation as one of many means and agencies in the great common struggle against pain and disease.

That confidence in radiation therapy is increasing is evidenced by the fact that increasing discussions of its merits appear in the medical literature and that all the clinics in the large medical centers are rapidly increasing their supply of radium for the various departments. This confidence is also expressed in the reports of world-wide increasingly better results. Gauss, speaking of malignancy, said,

"At Freiburg we no longer operate; we radiate." An eminent American authority speaks of radium in malignancy of the cervix as deserving of first consideration.<sup>14</sup> "Radium is a force of marvellous power, the limits of which are little known, but which occasionally works seeming miracles. I believe we are at the beginning of great things."<sup>12</sup> "Radium is a Godsend to the surgeon."<sup>15</sup> These are attainments worthy of profound consideration. They give us courage and renewed determination to persist diligently along these lines for the final solution of this great problem, and give suffering humanity relief or cure for some of the most cruel curses of our race.

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#### Book Review.

1. *Manual of Diseases of the Nose, Throat, and Ear.* By E. B. GLEASON, M.D., LL.D., Professor of Otology, Medico-Chirurgical College Graduate School, University of Pennsylvania. Fourth Edition. Thoroughly Revised. Philadelphia and London: W. B. Saunders Co. 1918.

Previous editions of this book have been reviewed in the JOURNAL. It is a textbook of 600 pages for students and practitioners. The present edition contains a considerable number of changes.

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## WESTERN MEDICAL METHODS IN THE ORIENT.

THERE has appeared recently in *The Clinic* an interesting survey of medical literature in Japan, China, and Korea. It is probably not generally realized that there has been established a system of medical periodicals in Japan, which indicates that considerable progress is being made throughout the Orient in western medical practice. In a review of current Japanese medical literature, prepared by the staff of the research department of a Korean institution, many facts are presented. In the Japanese *Journal of Dermatology and Urology*, the poisonous substances in the spiny lobster and crab are discussed. In another Japanese medical journal are reported the results of injecting dried liver, muscular tissue, and egg material into animals, the effects on the internal organs of viper poison, and the effects of the use of collargol in a case of rheumatism arising

from some specific malady. The Japanese *Medical News* presents a number of technical articles on disease, including a discussion of the hookworm disease and a study of the effects of the rue on tuberculosis.

Among a number of local periodicals devoted to medicine and allied subjects, there is the *Kyoto Journal of Medicine and Sanitation*, in which is considered the appearance of the blood in paroxysmal hemoglobinuria. The investigations of Japanese scientists on spirchetes are reported in the *Tokyo Medical News*. In one paper are discussed the extractives used for producing immunity; in another the destructive influence of the ultra-violet ray. Japan's journal of bacteriology, the *Saikingaku Zasshi*, presents in its two hundred and sixty-seventh issue some leucocyte counts of monkeys which were infected with smallpox, typhus, and tsutsugamushi or river fever. The *Journal of Medical Science of Kyoto* contains an article dealing with the excitation of nerve muscle preparations, and also a study of cancer of the stomach and kindred affections induced thereby in the liver.

In Tokyo there has been organized a medical society which publishes proceedings and which has contributed a considerable number of interesting papers. It is evident that Japan, as well as America, has problems in mental disease. From one article we learn that as the provision made by the State is very limited, the majority of persons suffering from mental disorders must be cared for at home. Most of these persons are under the unskilled care of their families, while some of them are treated by Shinto or Buddhist priests. In the general treatment of disease, however, it must be conceded that the picture which is sometimes visualized of Japan as a place where sacred relics and brazen gods are relied upon to effect cures should be replaced by a recognition of the definite progress which the people of the Orient are making at the present time in scientific medical methods.

## PREVENTABLE DISEASE AND THE AMERICAN RED CROSS.

UNTIL the present war, the Red Cross has symbolized in the public mind a great national force organized for disaster relief; during the course of the war, the activities of the organi-

zation have expanded into many new fields; and now, the Red Cross is planning to engage in activities which will reach far into future generations. A recent issue of the *Red Cross Bulletin* states that it is preventable disease which the Red Cross will undertake to combat, slowly, steadily, and persistently. The need for this activity is very great; while 48,000 American soldiers have died on the battlefield, 300,000 babies and young children have died in this country, many of whom might have been saved had the proper care been available. Statistics show that 16,000 mothers die every year in childbirth; diphtheria, in spite of antitoxin, caused the death of 15,000 children last year; the nation loses between 150,000 and 200,000 young men and women each year from tuberculosis; the influenza epidemic has a world casualty list of 6,000,000 people.

The fact that this disaster is to a great extent unnecessary is becoming recognized, and medicine is now concerned with the prevention as well as the cure of disease. Disease has become a social, rather than an individual problem. It is remarkable that the city, even in congested districts, has applied scientific health measures so successfully to its conditions that it has now become a safer place in which to live than is the country, which, although possessing far greater natural health advantages, has lagged behind the city in introducing public health measures. In order to promote rural sanitation and health, efforts are being made by the national government and by State boards of health in many states to secure for the country and small towns advantages similar to those by which the city has been benefited. For this purpose, the development of public health nursing activities has been begun, plans are being made for the inauguration of a course which will acquaint nurses with the field of public health, its administration, management, and relation to community welfare, and which will prepare them to become intelligent health promoters in their own communities.

#### MEDICAL NOTES.

CHANGES IN THE MEDICAL CORPS.—A number of changes have been made in the Medical Corps of the Northeastern Department. Lieutenant Colonel Omar Pinkston has been assigned to duty at Fort Andrews to relieve Major George

Guthrie; Lieutenant Colonel Peter C. Field will take the place of Major Arthur E. Austin as department surgeon; Lieutenant Colonel James B. Heysinger will go to Fort Williams at Portland; Lieutenant Colonel W. A. Powell has been detailed to Fort Slocum; and Sergeant A. M. Wotton, pharmaceutical chemist, and Hospital Steward E. D. Ball have been discharged from service.

VICTORIA HOSPITAL IN ROME.—The foundation stone of the Victoria Hospital in Rome, which was laid on April 28, bears the following inscription: "Victor Emmanuel III Rex Italiae lapidem auspicalem nosocomii a victoria excitandi sollemni ritu statuit iiii Kal. Maias Anno MCMXIX." The hospital is situated at Monteverde, and will cover an area of about 200,000 square metres. The capacity will be at first a thousand beds; later, this number will be increased to fifteen hundred.

QUATERCENTENARY OF LEONARDO DA VINCI.—The four hundredth anniversary of the death of Leonardo da Vinci was celebrated at Naples on May 2. In a recent issue of the *British Medical Journal* there has appeared the following interesting account of his work in anatomy:

The great artist was an enthusiastic anatomist. He began his studies in the Hospital of Santa Maria Nova at Florence in 1489, when he was in his 37th year, and continued them at Milan in the Ospedale Maggiore and the Collegio dei Fisici, and afterwards at Rome in 1513 till they were forbidden by Leo X, on a denunciation of body snatching made by some German enemies. He dissected more than thirty bodies of men and women of various ages, and his observations were collected in one hundred and twenty books; much of the manuscript has been lost, and the drawings designed to illustrate the text of a great work on anatomy to have been written in conjunction with Marc' Antonio della Torre, the famous professor of Pavia, lay forgotten in the Ambrosian Library at Milan, and afterwards in the Royal Library at Windsor, until they were discovered in 1902. They are now in course of publication. Some years ago E. Jaekschath of Berlin put forward a claim that Leonardo was the real founder of modern anatomy, and that Vesalius stole not only his discoveries but his drawings. While it is undeniable that the great Italian artist was a pioneer in anatomy, the fact remains that his work remained unknown for four centuries.

SCHOOL HYGIENE.—At a recent meeting in Milwaukee of the National Education Association, Section in School Hygiene, Mr. Frank Irving

Cooper discussed the problems involved from a hygienic point of view in schoolhouse construction. He called attention to the necessity of clean, airy, well lighted structures, creating an atmosphere of healthfulness and cheer, and a more uniform and adequate method of ventilating the buildings and making them sanitary. It was reported that in the one hundred and twenty-two of the school buildings tabulated by a committee, sixteen had no provision for special rooms for women teachers, emergency rooms, rooms for physicians; forty buildings had a room for the teachers, but lacked the other requirements; and only eighteen school buildings had a room for the school physician. Mr. Cooper emphasized the need that exists for the consulting school architect, who could supplement the skill of local architects with an expert knowledge of the requirements of school construction.

**MORTALITY STATISTICS FOR 1917.**—A recent report from the Census Bureau summarizes the mortality statistics from the death-registration area in continental United States for the year 1917. The annual compilation shows 1,068,932 deaths as having occurred in that area in 1917, representing a rate of 14.2 per 1,000 of population. Of these deaths, nearly one-third were due to three causes—heart diseases, pneumonia, and tuberculosis—and nearly another third resulted from the following nine causes: Bright's disease and nephritis, apoplexy, cancer, diarrhea and enteritis, arterial diseases, influenza, diabetes, diphtheria, and bronchitis. The death-registration area of the United States in 1917 comprised 27 states, the District of Columbia, and 43 cities in nonregistration states, with a total estimated population of 75,000,000, or about 73 per cent. of the estimated population of the United States. (The territory of Hawaii has recently been added to the registration area, but the figures given in this summary relate only to continental United States.

The deaths from heart diseases (organic diseases of the heart and endocarditis) numbered 115,337, or 153.2 per 100,000 population. The death rate from this cause shows a noticeable decrease as compared with 1916, when it was 159.4 per 100,000. Pneumonia, (including bronchopneumonia) was responsible for 112,821 deaths, or 149.8 per 100,000. This rate, although much lower than that for 1900 (180.5)

or for several succeeding years, is higher than that for any year during the period 1908-1916. Other deaths were from tuberculosis in its various forms, 110,285, showing an increase in 1917; Bright's disease and acute nephritis, 80,912, or 107.4 per 100,000; apoplexy, 62,431; cancer and other malignant tumors, 61,452; diarrhea and enteritis, 59,504; arterial diseases, 19,055; influenza, 12,974; diabetes, 12,750; diphtheria, 12,453; bronchitis, 12,311; typhoid fever, 10,113; measles, whooping cough, and scarlet fever, together, 21,723. Deaths due to external causes of all kinds—accidental, suicidal, and homicidal—numbered 81,953.

**EPIDEMIC INFLUENZA IN FOREIGN CITIES.**—A summary of epidemic influenza in foreign countries in a recent Public Health Report shows that as early as June and July, 1918, influenza was epidemic in Great Britain, parts of Europe, India, China, Africa, and Brazil. In the ninety-six great towns of England and Wales, there were three periods of sharply increased general mortality: (1) June 29—July 27; (2) October 5 to December 21; (3) February 8 to March 22,—the highest mortality rates being 21.2, 48.3, and 35.7, respectively. These three waves occurred in each of the 13 large cities. The death rates of Continental Europe and Indian cities throughout 1917 and the first half of 1918 were abnormally high or irregular; increased death rates which may safely be attributed to influenza were noted in July in Bombay, Madras, Calcutta, and Christiania. In August, distinctly increased death rates, presumably indicative of the influenza epidemic, were recorded in Stockholm, Copenhagen, and Amsterdam. In all the cities of this group there was a sharp increase in mortality rates, beginning at various dates from the first half of October to the latter part of October. The third wave of mortality in British cities was shown in the Indian cities, Bombay, Madras, and Calcutta, and in Paris.

**HONORARY DEGREES AT YALE UNIVERSITY.**—Among the honorary degrees conferred at the commencement exercises at Yale University, two were awarded to physicians, in the following terms:

Samuel Hosea Wadham: A graduate of Sheffield, in 1894, a surgeon in the regular army, serving in the Spanish War, early sent to

France as an observer, placed later on the General Staff, in tact, in vision, in ability pre-eminent, Colonel Wadhams, more than anyone else, has shaped the policy of his department. During our share in the war, he has borne the entire responsibility for the wounded in the battle area, has won the admiration of his fellow workers, and has earned the honor which his university desires to pay.

Harvey Cushing, Son of Yale, and Harvard professor, a leader in the new field of neurological surgery, in operations of the brain pre-eminent, surgeon in chief of the model Brigham Hospital, honored at home and abroad. Colonel Cushing served with the French in 1915 and 1917, with the British at Messines and Passchendaele, being mentioned in dispatches. At this time organizing intensive study of penetrative skull wounds, he reduced their mortality by one-half. Under our own flag he became chief consultant in neurological surgery for the A.E.F. A gentleman, a bold investigator, an artist in the operative field.

**WAR WORK AT ST. ANDREW'S UNIVERSITY.**—Because the endowments of the university do not permit unlimited extension along varied lines of study, the war record of the University of St. Andrew's has been an interesting one from the point of view of scientific research. Throughout the period of hostilities a great deal has been accomplished at this school in obviating the difficulties, especially the early ones, which were met by the British Government when supplies which heretofore had been prepared in Germany were produced in the St. Andrew's laboratories under the direction of Prof. Irvine.

Nearly all the students and members of the medical staff who were of an age to do so joined the colors; consequently, there fell to the senior instructors and the group of able women who assisted them, the task of devising methods of meeting the lack of raw materials needed by the Admiralty and the War Office.

New processes for the manufacture of novocain and other synthetic drugs, researches into chemical fillings for shells, the manufacture of materials necessary for cordite, and for providing the government with costly kinds of sugar,—these and many other helpful methods were brought to light. Thus the long established policy of the authorities in training graduates

for research work has perhaps more than ever before proven its great worth.

Although the university stands ready to further its principles of combining training based on fundamental scientific rules with a better knowledge of the necessities and methods of manufacture, the authorities are not at all certain as to financial help which may be expected from the government. Believing that the interests of science will be furthered by so doing, the university has adopted the plan of admitting students who wish to enter at a later age than usual by removing the obstacle which preliminary examination might set in their path, and by instituting systematic courses of instruction in connexure which lead to graduation.

**PUBLIC HEALTH COURSES AT YALE UNIVERSITY.**—Prof. C. E. A. Winslow of Yale University has recently prepared an outline of the work planned by the Department of Bacteriology and Public Health for those who wish to apply themselves to the important training for Public Health Administration. Progressive study in these classes leads to a Certificate in Public Health, a Doctorate in Public Health, or to the Doctorate in Philosophy.

Students who wish to qualify for the Certificate in Public Health may be of three groups: firstly, those who, just graduating from a college or a technical school, desire to pursue for one year a post-graduate course of training in bacteriology, sanitation, health organization, and vital statistics, with a view toward fitting themselves for positions in health department laboratories, statistical bureaus, bureaus of child hygiene, etc. Secondly, those students who, having already specialized in some field relating to public health, may wish to concentrate their attention on public health campaigns; thirdly, those who wish to specialize in greater detail may take a three-years' course leading to the degree of Doctor of Philosophy. The subjects for study in the last course are carefully outlined with a view to major specialization. Interesting positions in the wide field of public health work may be secured by graduates of any one of the courses referred to above, and the degree of Doctor of Philosophy and the Certificate of Public Health are both open to men or women college graduates with certain necessary prerequisites.



A further course is also contemplated for medical graduates. This will require two years of study in which the work will be practical as well as theoretical and thus will present suitable opportunities for individual endeavor.

#### BOSTON AND MASSACHUSETTS.

**WEEK'S DEATH RATE IN BOSTON.**—During the week ending August 9, 1919, the number of deaths reported was 167 against 201 last year, with a rate of 10.94 against 13.36 last year. There were 38 deaths under one year of age against 44 last year.

The number of cases of principal reportable diseases were: Diphtheria, 23; scarlet fever, 12; measles, 8; whooping cough, 12; typhoid fever, 1; tuberculosis, 58.

Included in the above were the following cases of non-residents: Diphtheria, 1; scarlet fever, 3; tuberculosis, 2.

Total deaths from these diseases were: Scarlet fever, 1; whooping cough, 1; tuberculosis, 18.

Included in the above were the following non-residents: Tuberculosis, 1.

**RETURN OF BEVERLY HOSPITAL UNIT.**—Members of Field Hospital Unit No. 30, made up of residents of Beverly, have recently returned to this country. The unit was organized more than two years ago and served for one year overseas.

**BEQUESTS TO MEDICAL INSTITUTIONS.**—Among the bequests in the will of the late Mrs. Fanny Young of Boston were the following gifts to medical institutions: Convalescent Home of Children's Hospital, \$10,000; Industrial School for Crippled and Deformed Children, \$8,000; Perkins Institute for the Blind, \$8,000; Massachusetts General Hospital, \$5,000; Boston Floating Hospital, \$4,000; District Nursing Association, \$3,000.

**BABY HYGIENE ASSOCIATION.**—At a recent meeting of the Baby Hygiene Association, it has been announced, Miss Winifred Rand, director, reported that nearly six thousand children are under the supervision of the Association. Dr. William C. Woodward, city health commissioner, discussed the value of hygiene in conserving the health of babies. Dr. Fritz B. Talbot, chief of the children's service of the Massachusetts General Hospital, pointed out the difficulties in securing the milk supply and ad-

vised that the problem be systematically investigated.

The Association has a staff of twenty-eight nurses, five dietitians, and twenty-one conference physicians. Twenty-eight conferences are held each week. Every month there are from ten to fifteen students in the public health course for training in infant welfare.

**PROMOTION OF BOSTON PHYSICIANS AND SURGEONS.**—The following six Boston physicians have been promoted to the rank of commander in the Medical Corps of the Naval Reserve: Leroi Goddard Crandon, Halsey DeWolf, Robert B. Greenough, George Arnold Matteson, Milton Joseph Rosenau, and Frederick John Patton.

**PROMOTION OF DR. POTTER.**—Dr. George E. Potter of Wakefield has been promoted to the rank of major. Dr. Potter has been with the Red Cross relief expedition in Poland and along the eastern front since the signing of the armistice, before which he had been in charge of the dental work in one of the base hospitals in Paris. He is a graduate of Tufts Dental School.

**GOVERNMENT CONTROL OF HOSPITALS.**—A series of government hospitals under the direction of the United States Public Health Service are providing care and treatment for former members of the Army, Navy, Marine Corps, and Shipping Board who have become ill or injured during the war. The Marine Hospital at Chelsea, Robert B. Brigham Hospital and Elks' Hospital at Parker Hill, Roxbury, the West Roxbury annex of the Boston City Hospital, and the East Norfolk Hospital are now under the single control of the Public Health Service. The East Norfolk Hospital has been designated for the care of epileptics.

Cases requiring examination by x-ray, pathological examination, hospital treatment, or observation are sent to the general hospitals at Chelsea or Parker Hill. Major E. K. Sprague is the commanding officer. The Roxbury and West Roxbury hospitals can accommodate nine hundred patients. The Robert B. Brigham Hospital was taken over from the Army on July 1, and now has one hundred and twenty cases under observation and treatment.

Captain Frank A. Davis of the United States Public Health Service is executive officer. Med-

ical and surgical departments have been established and wards opened for neuro-psychiatric, nose and throat, eye and ear, genito-urinary, physio-therapy, x-ray and pathological laboratories. The Elks' Hospital will be opened this summer. The Red Cross maintains a branch bureau at each hospital and provides entertainment, comforts, and home service.

**CONSUMPTIVES' HOSPITAL TO TRY RECONSTRUCTION WORK.**—To show those patients who are able and also wish to occupy their spare time, how to make useful and ornamental things, is the object of a special committee of the trustees of the Boston Consumptives' Hospital, Dr. James J. Minot, chairman, in coöperation with the Boston Association for the Relief and Control of Tuberculosis, says Seymour H. Stone, secretary of the Association.

The work will begin September 3 at the Boston Consumptives' Hospital, Mattapan, and will be carried on by Miss Dorothy S. Emmons, a trained reconstruction aide, who has been instructing soldiers at the U. S. A. General Hospital No. 16, New Haven, Conn.

This experiment will be started with only a few of those patients who really desire to undertake it in earnest. If articles can be properly finished, an attempt will be made to have them sold and the profit turned over to the patient. Patients will also be enabled to make Christmas presents for their relatives and friends.

In the government hospitals this reconstruction work is conducted on a large scale and much raffia work, wooden toys, and beautiful bead work has been produced. The effect has been to make the patients more satisfied and contented and thus aid in their improvement.

**SEMI-CENTENNIAL OF THE MASSACHUSETTS STATE HEALTH DEPARTMENT.**—The semi-centennial of the Massachusetts State Health Department will be held at the State House on the afternoon of September 15, under the auspices of the Massachusetts Medical Society, the Associated Boards of Health, and the State Health Department. Addresses will be given by Governor Coolidge, Health Commissioner Eugene R. Kelley, Former Commissioner Colonel Allan J. McLaughlin of Washington, D. C., Sir Arthur Newsholme of London, Professor William H. Welch of Johns Hopkins, and Dr.

Henry T. Waleott of Cambridge, former chairman of the State Board of Health.

**REQUESTS TO HOSPITALS.**—The will of the late Arthur Frederic Estabrook includes the following bequests: \$100,000 to the Massachusetts Homeopathic Hospital; \$10,000 each to the Children's Hospital, Boston Floating Hospital, Massachusetts Charitable Eye and Ear Infirmary, Massachusetts Association for Promoting Interests of Adult Blind; \$5,000 each to the Newton Hospital, Cambridge Hospital, New England Hospital for Women and Children, Boston Lying-In Hospital, Thomas Morgan Rotch, Jr., Memorial Hospital, Free Hospital for Women in Brookline, Waltham Baby Hospital, New England Baptist Hospital, Lynn Hospital, Sharon Sanitarium, Boston Dispensary, Home for Aged Women, Boston Home for Incubables, Children's Island Sanitarium, Cullis Consumptive Home, St. Luke's Home for Convalescents; and \$2,000 each to the Boston Nursery for Blind Babies and the Kindergarten for the Blind.

**GIFT TO THE LYNN HOSPITAL.**—In the will of Maria B. Merrill of Lynn there is included a gift of \$1,000 to the Lynn City Hospital.

**ADAMS NERVINE ASYLUM.**—The Adams Nervine Asylum, Jamaica Plain, receives and cares for persons who, though not insane, are suffering from some disease of the nervous system which can be benefited by treatment at the Asylum. The forty-second annual report shows that there were treated during the year two hundred and thirteen persons, all of whom were women. The Men's House has remained closed, and this, combined with the exercise of strict economy elsewhere, has reduced expenses by about \$2,750 over last year. One hundred and nine patients have recovered or been discharged relieved. Of the service rendered, twenty-two per cent. was without charge, and fifty-seven per cent. was given to those who paid less than actual cost. Eight nurses were graduated during the year.

**AMERICAN FUND FOR FRENCH WOUNDED.**—At a recent meeting in Boston, Mrs. Benjamin G. Lathrop, president of the Fund for French Wounded, outlined the work which has been done by this organization. There are to be 100 beds to be endowed for the sum of \$6,000, each

in the hospital, which will be erected at Rheims. It will be free to women and children. Forty thousand crates of clothing and supplies have already been sent to be used in the hospital.

The fund was started in the spring of 1915. There have been established forty-eight dispensaries and five million dollars have been spent in emergency relief work. At the Mourthe and Moselle dispensary twenty thousand patients were cared for by the Fund in conjunction with the medical department of the American Red Cross. A motor service, which became the largest woman's organization on the continent, was organized. Americans, as well as French, were cared for, and a reading room was established in Paris. The workers are now gradually withdrawing from their districts, leaving the work organized and ready to be taken over by the French people themselves. Their efforts will be confined to raising funds for the hospital at Rheims.

#### NEW ENGLAND NOTES.

**RHEIMS HOSPITAL FUND**—Contributions to the New England Branch of the American Fund for French Wounded for the American Memorial Hospital have reached a total amount of \$158,686.59.

**NEW ENGLAND SANATORIUM AT RUTLAND.**—The Central New England Sanatorium at Rutland will care for a number of discharged tuberculous soldiers and sailors under the supervision of the Bureau of War Risk Insurance. The Government has decided to make use of this private institution, although this is an exception to its general policy, because of the excellent educational and occupational facilities afforded there to tuberculous patients. It has been pointed out that the increase of this disease in the National Army following the draft, resulting in the development and discovery of approximately 10,000 cases, indicates the extent to which the public health is menaced by the return of these discharged soldiers to civil life. It has been estimated that of the discharged disabled soldiers and sailors, twenty-two per cent. are tuberculous. The Central New England Sanatorium is only a short distance from the industrial and agricultural colony known as the Rutland Private Sanatorium Association, an institution which affords a social and economic side to life for tuberculous patients rarely found elsewhere.

## Obituary.

EDWARD COWLES, M.D.

DR. EDWARD COWLES died recently at the age of eighty-two at his home in Plymouth. Dr. Cowles was born in Ryegate, Vermont, on July 20, 1837, the son of George and Mary (Bradley) Cowles. He received a medical degree from Dartmouth in 1863, and from the College of Physicians and Surgeons, New York, and later received the degree of M.D. from Columbia University, and an LL.D. from Dartmouth in 1890.

Dr. Cowles first became an assistant physician at the Retreat for the Insane, in Hartford, Connecticut, in 1863. From that year until 1872 he was also assistant surgeon in the United States Army, with the rank of captain. In 1872 he became resident physician and superintendent of the Boston City Hospital, where he remained until 1879. He then became medical superintendent of the McLean Hospital, for the treatment of the insane, and held that position until 1903. He directed its removal to Waverley and supervised the erection of what was at that time one of the finest hospitals of its kind in the world. He accepted the professorship of mental diseases at the Dartmouth Medical School in 1885 and continued until 1914. He was also instructor in mental diseases at the Harvard Medical School from 1889 to 1914, and for sixteen years he had been a non-resident lecturer on the same subject at Clark University in Worcester.

Dr. Cowles developed the scientific side of hospital work to a considerable degree, and was the first to conceive and carry out the system of scientific study of the insane within the institution itself, with proper laboratory equipment and a corps of experts. He was also interested in the professional training of nurses for the care of the insane. In his later years he watched with interest the rise and decline of Kraepelin's views, with which his sympathy was limited. He was interested also in psychoanalysis, although not a believer in the extreme views of Freud. He contributed a number of important scientific publications to American psychiatry.

Dr. Cowles was a Fellow of the American Association for the Advancement of Science, a member of the American Psychological Association, American Neurological Association, American Medico-Psychological Association, of which he was at one time president, and he belonged

to the American Academy of Medicine, American Medical Association, Maine Medical Association, the Massachusetts Medical Society, the Boston Society of Psychiatry and Neurology, and the National Geographical Society, as well as foreign medical societies.

On December 25, 1865, Dr. Cowles married Miss Harriet M. Wainwright of Hanover, New Hampshire. He had outlived his wife and is survived only by a brother, Frank Cowles, of Plymouth.

### Correspondence.

COMBINED SECRETARY, OFFICE ASSISTANT,  
AND HOME HELPER.

Philadelphia, Pa.

Mr. Editor:—

Many professional men of limited means need a secretary who may or may not officiate also as an office assistant. Many qualified girls need a safe and comfortable home and may be willing to lend a hand in domestic economies. A steadily increasing number of professional men's wives need a reliable home helper. Why should there not be made a most suitable combination, upon an equitable basis of mutualities, of these groups of petitioners? The advantages to each will be obvious. They deserve to be discussed upon a constructive and conciliatory basis. Difficulties are by no means insuperable or even serious and can be fully met and adjusted to the abounding comfort of all the parties in interest. We must realize that the time is upon us when pronounced concessions and adjustments must imperatively be made. Radical changes are confronting society. Those are wise citizens who take candid council with his or her best self and begin at once to discard ancient prejudices, to compromise social preferences and customs in the face of inevitable dislocations. First, the wife may object to the unusual, unprecedented, socio-domestic problem. Here we have the proposition of a young woman, a stranger, in the home, who is not a servant nor a "social equal," who yet must be adapted to the "peculiar situation." There we have ground for debate at once. New standards must be made to meet entirely novel and somewhat awkward demands. The sooner that situation is accepted and settled fairly and candidly, the better for all concerned. The candidate for position of secretary or office assistant and likewise contributor to domestic comforts will put in claims for special privileges. All right. Let matters be adjudicated with all the liberality possible. The problem will work itself out if each one is reasonable and also fully appreciates the abundant advantages for all and everyone. Some such arrangements must be made, and that speedily. Beware of those dangerous delays in foresightedness and preparedness which proved so vexing and perilous during the war. We then learned the lessons which would serve for many lifetimes. Let every professional man's wife call a meeting for discussion at once of all those similarly circumstanced in her neighborhood and reduce the propositions to a practical working plan.

Just consider what is gained by such a triple transaction. Each of the parties in interest acquire three most important assets. Only foolish persons would balk at the difficulties.

J. MADISON TAYLOR, A.B., M.D.

### POLYPOID GROWTH OF THE PLACENTA.

Massachusetts Homeopathic Hospital,

Boston, Aug. 11, 1919.

Mr. Editor:—

I wish to report the following rather interesting case for publication:

During my internship on the maternity service at the above institution the following case came to my observation.

A patient, multipara 11, was first seen in the prenatal clinic at about seven and a half months gestation and, on examination, fetus could be made out in L. O. A. position—fetus heart sounds in left lower quadrant, and on the right side could be felt a globular mass, easily palpable, which felt somewhat like another head, but no fetal parts corresponding with it, or other signs of multiple pregnancy could be ascertained. The patient was getting along very nicely, and she was delivered at term—very simple delivery, no anesthesia necessary—but the fundus remained above the umbilicus, rather high, but yet firm, with no bleeding. After waiting for about fifteen minutes with no very strong contractions taking place, I creeded very gently, whereupon uterus contracted firmly and the placenta was delivered with the membranes and several large clots and a moderate gush of blood, after which the fundus contracted down firmly to a position two and a half fingers' length below the umbilicus with no bleeding. As a matter of routine she was given ergot. After washing the clots away from the placenta I noticed a globular mass of tissue, rather fleshy in appearance, firm consistency, and encapsulated, attached to the placenta by a thick fibrovascular pedicle—diameter, 7 cm.; weight, 125 gms. Upon microscopic examination it was found to be composed of muscle fibres and connective tissue. Diagnosis: Polypoid growth of the placenta. The patient made an uneventful recovery and was discharged on the twelfth day, mother and baby O. K.

LOUIS FELDMAN, M.D.

### RECENT DEATHS.

DR. JOHN H. SHERMAN died recently at his home in South Boston at the age of eighty-eight years. Dr. Sherman was born in China, Me., on Oct. 22, 1830. He received his medical degree from Castleton Medical College, Vermont, in 1857, and continued his studies in Augusta, Me. He practised in Nantucket, Middleboro, San Francisco, and Lynn before settling in South Boston in 1873. Dr. Sherman had served as president of the Massachusetts Homeopathic Medical Society, the State Surgical Society, and the Boston Homeopathic Society. He was a member of the American Institute of Homeopathy and an honorary member of the Maine State Homeopathic Society. He is survived by one daughter, Miss Elizabeth C. Sherman.

DR. ELI E. GRAVES died recently at his home in the Penacook district of Concord, New Hampshire. He was born in Jericho, Vermont, on Sept. 9, 1847, and was educated at the University of Vermont and at the Harvard Medical School. Dr. Graves contributed a number of articles to medical literature.

DR. ERNST HEINRICH HAECKEL, Professor Ernst Heinrich Haeckel died at Jena, Germany, on August 9, Professor Haeckel was born in Potsdam on February 16, 1834. At his father's wish he studied medicine and started practising in Berlin, but he became deeply interested in scientific research and later became professor of zoology in the University of Jena, a position which he held for nearly fifty years. Perhaps no one, with the exception of Darwin and Wallace, has done so much as Haeckel to defend the doctrine of evolution.

# The Boston Medical and Surgical Journal

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## Original Articles.

### GASEOUS EXCHANGE WITH UNPRACTICED SUBJECTS AND TWO RESPIRATION APPARATUS EMPLOYING THREE BREATHING APPLIANCES.

[From the Nutrition Laboratory of the Carnegie Institution of Washington, Boston, Mass.]

BY M. F. HENDRY, T. M. CARPENTER, AND L. E. EMMES, BOSTON.

THE increasing number of clinical studies of respiratory exchange necessitates the careful investigation of respiratory apparatus and breathing appliances recently developed. The apparatus probably most used at the present time is of the so-called Tissot type. A portable respiration apparatus which has lately been devised, primarily for the determination of the most important respiratory gas, *i.e.*, oxygen, has proved of special interest to clinicians. At least three breathing appliances have found extensive use, a mouthpiece, a nosepiece, and a half-face mask. The combinations possible with these two respiration apparatus and three breathing appliances need careful study to aid the experimenter in selecting the one best suited to his purpose. Such a comparative study has been made in this laboratory.\*

\*We desire to acknowledge the helpful advice and criticism of Professor Francis G. Benedict, at whose suggestion this investigation was made.

Some of the questions investigated in this research may be stated as follows:

Do the two respiration apparatus give comparative values for the oxygen consumption of a subject?

What are the differences, if any, in the carbon-dioxide elimination and respiratory quotient?

If there are differences in these values, what are the technical and physiological causes for the variations as interpreted from the measurements of pulse rate, respiration rate, volume per minute of the respiratory ventilation, and composition of expired air?

The differences in the results obtained with the three breathing appliances were also measured for both apparatus. Concurrently information was obtained on several other matters of interest to users of apparatus for determining the respiratory exchange, *viz.*, the constancy of the level of the respiratory quotient during several hours of the post-absorptive state; the constancy of the total energy output (heat production) as measured by the oxygen consumption; and lastly (of prime importance to clinicians), whether measurements of the respiratory exchange with any of the combinations of apparatus are reliable when untrained subjects are used.

Arrangements were made through the kind-

ness of Dr. Cecil K. Drinker of the Harvard Medical School for some of the first year medical students to act as subjects. While these young men were taking a course in physiology, they were in no way familiar, at that time, with respiration apparatus of any kind. Each subject came to the laboratory for the first time on the morning of the experiment.\*

The respiratory apparatus and accessory apparatus used in this research are described in the following paragraphs.

#### PORTABLE RESPIRATION APPARATUS.

In the portable respiration apparatus recently developed in the Nutrition Laboratory, the oxygen absorbed by the subject is determined by measuring the contraction in volume of an enclosed circulating current of oxygen and nitrogen which a subject respires and from which both the water vapor and the carbon dioxide exhaled from the lungs are absorbed. This method gives a volumetric determination which is therefore subject to the ordinary corrections for reducing the value to 0° C. and 760 mm. pressure, and also requires the important assumption that the volume of air in the respiratory tract of the subject is the same (within experimental limits) at both the beginning and the end of the period.

The carbon dioxide elimination is determined by the absorption of this gas in soda lime. To determine the carbon dioxide elimination by the method of absorption, it is necessary in a closed-circuit respiration apparatus that provision first be made for the absorption of water vapor. In this apparatus use is made of calcium chloride for the purpose. The determination of oxygen consumption, then, is volumetric and the determination of carbon-dioxide elimination gravimetric.

The principle of the Benedict portable respiration apparatus is practically the same as that of the original universal respiration apparatus<sup>1</sup> as employed for man. As with the older apparatus, the subject is connected with the circulating current of air by means of a three-way valve and a breathing appliance (mouthpiece, nosepieces, or mask.) The actual routine of the experiment is the same for the two apparatus but instead of using a blower in series with the

absorbers as in the universal respiration apparatus, the air current in the portable respiration apparatus is actuated by a rotary air impeller (hair dryer) which is placed inside the spirometer. Thus leakage of air from the ventilating current is obviated, and the only leaks possible are such as may be due to poor mechanical construction or to imperfect connection of intermediate parts by unskilled operators. *These can be detected by a test for tightness preceding each experimental period.*

For the actual routine of a period with this apparatus, reference must be made to the original description,<sup>2</sup> which should be regarded as a handbook for operators. In brief, it may be stated that the subject is first connected with the apparatus by means of the breathing appliance selected. After the soda-lime container and the calcium-chloride container following it have been weighed, the three-way valve connecting the subject with the circulating air current is turned at the end of a normal expiration, the time is noted, and the subject respires for 10 to 15 minutes. At the end of a normal expiration the valve is again turned and the subject is disconnected. The spirometer is read both before the beginning of the period and after the end, the difference in the height of the spirometer bell showing the contraction in the volume of air due to the absorption of oxygen by the subject. The carbon-dioxide elimination may be determined by the increase in weight of the soda-lime bottle and the calcium-chloride container following it.

In this investigation, a graphic record of the respiratory ventilation was obtained by means of a pointer, attached to the counterpoise of the spirometer, which wrote upon the smoked surface of a moving kymograph drum. The manner of obtaining this record and its relationship to the respiration and the oxygen consumption of the subject have been fully discussed in a former publication from this laboratory.<sup>3</sup> To obtain a complete record of the respiration movements during a period, two drums of the Harvard Apparatus Co. kymograph were joined one above the other and a paper wide enough to cover them both was used. A special arbor was constructed to support the double drum, and the ordinary form of kymograph was employed.

The volume of a single respiration can be obtained by measuring the vertical distance

\* The subject's first reception in that, as subsequently stated, H. O. was brought to the laboratory in the Nutrition Laboratory.

between the beginning and end of a single phase of a respiration, either inspiration or expiration, and multiplying this distance by the value in cubic centimeters of one millimeter or one centimeter of the vertical cross section of the spirometer bell. The total apparent ventilation of the lungs during the experimental period is the sum of the individual respirations. Instead of measuring the respirations separately, their summation was obtained by scaling the individual vertical distances with a "map measurer." This map measurer has several scales on it, one of which is centimeters to kilometers. The sum of the vertical lengths was found to be in the neighborhood of 350 centimeters. Measurements of the total vertical distance in a single period, which were made independently by two persons, were found to agree, usually within two per cent. of each other. It was considered, therefore, that this method of measuring the summation of individual respirations met every requirement for accuracy in this research.\* Accordingly, all of the values given for the periods obtained with the portable respiration apparatus are based upon measurements made by two individuals, independently, which agree within two to five per cent. In doubtful cases, the summations were checked by the measurement of the individual respirations with a millimeter scale. The figures obtained with the map measurer were multiplied by the volumetric value of each millimeter (ca. 21 c.c.) and this result was then reduced to 0° C and 760 mm. pressure by suitable factors involving barometer, temperature, and tension of aqueous vapor. Special experiments were conducted to determine the temperature conditions prevailing in this measurement. So far as errors involved in barometric pressure, tension of aqueous vapor, and temperature are concerned, it is considered that any rôle they might play has no effect upon the conclusions drawn from the results.

The possibility of a mechanical or instrumental error should be considered. The pointer attached to the counterpoise of the spirometer consisted of a steel wire about 0.5 millimeters thick and 10 centimeters long, with a pointed piece of parchment paper at-

tached to the free end. A moving pointer rubbing against a moving smoked surface involves a certain amount of friction, and it is conceivable that any record of a simple harmonic motion of a rigid body (such as the spirometer bell), which is dependent upon the inscription of its movements by means of a flexible pointer writing upon a surface involving friction, would be in error because of the lag at each end of the motion or change in direction. There are two facts to be considered in relation to the results of our research, *viz.*, that the movements of the air or the spirometer itself are slowest at the beginning and end of the two phases of the respiratory cycle, inspiration and expiration, and that if this possibility of error due to friction does play a rôle in the accuracy of our measurements of the total ventilation with the portable respiration apparatus, its effect will be to give too low results. The significance of the latter point will be seen when the data are discussed. In spite of the possibilities of technical errors, our belief is that no one of our measurements of the total ventilation with either apparatus has an error greater than five per cent. Our conclusions are not based upon such small differences.

Assuming a correct measurement of the total ventilation, it is possible with the portable respiration apparatus to calculate the composition of the expired air, so far as the percentage of the carbon-dioxide and the oxygen deficit are concerned, simply by dividing the carbon dioxide eliminated and the oxygen absorbed by the total ventilation. The volume per respiration can also be calculated from the total ventilation and the respiration rate.

The measurement of the total ventilation of the lungs as outlined and the data derived from it and from other observed factors form the basis of our results and conclusions given in this report.

#### RESPIRATORY-VALVE APPARATUS.

The other respiration apparatus used in this study was the so-called Tissot<sup>†</sup> respiration apparatus, or more properly the respiratory-valve apparatus.\* The most recent forms of respiratory-valve apparatus ordinarily employ a

\*The use of the map measurer was suggested to one of us (T. M. C.) by a former assistant, W. F. Barrington. It has proved very useful in the technical study of respiratory apparatus.

†The name Tissot has been incorrectly applied to a number of combinations of respiration apparatus that are not really the Tissot apparatus, which involves glass neopneuses, valves, an ingeniously water-balanced spirometer, and a Luidanié gas analysis apparatus.

mask<sup>2</sup> as a breathing appliance. Usually the Thiry-Tissot valves<sup>6</sup> are also employed, but that other valves are equally suitable for this purpose has never for a moment been questioned or denied. It is not necessary that the spirometer be absolutely counterpoised<sup>7</sup> at each point to obtain a normal respiratory exchange. Actual experience shows that the portable Haldane gas analysis apparatus is entirely adequate for all analyses of expired air and that any irregularities of analysis will apply as much to other gas analysis apparatus as to the portable form of the Haldane apparatus. In view of these considerations we can no longer consent to designate every open-circuit apparatus based upon breathing appliance, respiratory valves, spirometer, and gas analysis as a Tissot respiration apparatus. We acknowledge our indebtedness to Tissot for pointing out the possibilities of refinement in the measurement of gaseous exchange by this method, but we must state that accurate determinations by the open-circuit method of the respiratory exchange of man are regularly made without utilizing any of the apparatus which were devised by Tissot.

The combination used in this comparison research was a spirometer approximately counterpoised and holding about 100 liters, Thiry-Tissot valves, a breathing appliance, and a Haldane portable gas analysis apparatus. The breathing appliances used were the same as those employed with the portable apparatus.

The principle of the respiratory-valve apparatus is as follows: The subject inhales through an inspiratory valve and breathing appliance and expires through an expiratory valve. The inspired air and expired air are thus separated by means of valves. The inspired air may be taken from the room or from outdoors. We prefer to use outdoor air because of its constant composition,<sup>8</sup> thus reducing the amount of gas analysis. The expired air is conducted to a spirometer in which it is collected for a definite period of time. A three-way valve placed at the entrance tube of the spirometer permits deflection of the expired air into the room or into the spirometer.

In the usual routine of a period with this method, the breathing appliance with valves is first attached to the subject, and the spirometer

is set at 0. When it is seen that the subject is breathing quietly and regularly, the three-way valve is turned so that the expired air, which has been passing out into the room, now enters the spirometer. The exact time of turning the valve is noted. At the end of a definite period (usually ten minutes) the three-way valve is turned so that the expired air is again delivered into the room. The time is noted, and readings are taken of the height of the spirometer bell, the temperature of the air in the bell, and the barometric pressure. Two samples of the air in the spirometer are then drawn in 70 c.c. samplers over mercury and subsequently analyzed. One portion from each sampler was used for analysis, thus providing for duplicate analyses. All analyses not agreeing within reasonable limits were repeated. The composition of these samples, multiplied by the quantity of expired air reduced to 0° C. and 760 mm., gave the amount of the respiratory exchange.

#### BREATHING APPLIANCES.

The breathing appliances used in this comparison were the Denayrouse form of rubber mouthpiece,<sup>9</sup> the Benedict nosepieces,<sup>10</sup> and the Siebe-Gorman half-face mask.<sup>\*</sup> The mouthpiece was of the type employed for many years in respiration work, particularly by Zuntz and his co-workers. A detailed description and criticisms regarding its use have been given in a publication from this laboratory.<sup>11</sup> The half-face mask employed was originally designed for mine rescue apparatus, but is now coming into general use in physiological laboratories and hospitals in which respiratory exchange is being studied. It is approximately triangular in form and is made of sheet metal covered with vulcanized rubber. It is thus flexible so that it can be readily shaped to fit the face of the subject. A pneumatic gasket around the edge of the mask can be inflated, thus making it possible to fit the inequalities of various parts of the face and insure an absolute air-tight closure. The mask is of such size and form that it fits over the upper part of the bridge of the nose, down each cheek, and across the chin just beneath the mouth. It is fastened on the face by means of two straps connecting at the back part of the head.

<sup>1</sup> Experiments in this laboratory in 1915-1916 demonstrated that the composition of outdoor air is stable for continuous or interrupted work on the open-circuit method, e.g., a breathing appliance connected

<sup>\*</sup> This may be obtained from H. N. Elmer, 1140 Monadnock Building, Chicago, Ill.



## GAS ANALYSIS APPARATUS.

The samples of expired air were analyzed by means of the portable form of the Haldane gas analysis apparatus.<sup>12</sup> Two apparatus were employed in this research, each controlled daily by an analysis of outdoor air collected in the identical containers used for drawing samples from the spirometer. The values obtained in these analyses of outdoor air were for carbon dioxide from 0.02 to 0.03 per cent., and for oxygen from 20.91 to 20.94 per cent., with an average of 20.93 per cent. A solution of 10 per cent. caustic soda was used for the absorption of the carbon dioxide; potassium pyrogallate made up according to the directions of Haldane<sup>13</sup> was employed for the absorption of oxygen. All of the determinations were carried out by one analyst (M.F.H.).

## ACCESSORY APPARATUS.

The accessory apparatus were principally those required for control purposes and consisted of pneumographs, a kymograph, recording tambours, signal magnet, push buttons, and a time clock.

*Apparatus for Time Record.* A clock was used which was so arranged that it would close an electric circuit every half minute. Connection with a signal magnet gave a record upon the kymograph drum of the closing of the circuit. The clock was also in series with a push button by means of which the operator could record upon the kymograph the exact beginning and end of the period. This record acted as a control upon the total length of the period as obtained with a stopwatch. This control is to be recommended as it sometimes happens that either the split-second watch stops or there is a mistake made in recording the time.

*Apparatus for Recording Respiration Rate and Degree of Repose.* A pneumograph was placed around the thorax of the subject to provide a graphic record of the respiration rate. Movements of the upper portion of the body were also shown in this record. A second pneumograph was placed about the upper thighs so that the slightest movement of the legs would be recorded upon the kymograph drum. These two pneumographs enabled us to detect immediately any movements which the subject might make and to determine the degree of repose.

*Apparatus for Detecting Sleep.* In addition

to the records of activity or repose, we also used a control upon drowsiness or sleep. This was obtained by means of a signal magnet placed near the subject's head and in series with the clock previously mentioned. The magnet operated every half minute and was heard by the subject if he were awake. He was instructed to press a push button held in his hand whenever he heard the signal magnet. As the subject's push button was connected with an independent signal magnet recording upon the kymograph drum, a definite graphic record was obtained as to whether or not the subject responded the entire experimental period. *This is very important in studies of the respiratory exchange, as our experience has been that drowsiness tends to alter the ratio between the carbon dioxide eliminated and oxygen consumed. Whether or not there is also a real difference in the character of the combustion cannot at this time be stated.*

## PLAN OF STUDY AND SEQUENCE OF PERIODS.

We had the problem of determining the respiratory exchange of a subject each day with two different respiration apparatus and three different breathing appliances. To avoid any influence from one order of combinations for all subjects, the following six sequences of periods were used:\*

I	II	III
Tissot, mouth	Portable, mouth	Tissot, mask
Portable, mouth	Tissot, mouth	Portable, mask
Tissot, mask	Portable, mask	Tissot, nose
Portable, mask	Tissot, mask	Portable, nose
Portable, nose	Portable, nose	Tissot, mouth
Tissot, nose	Tissot, nose	Portable, mouth
IV	V	VI
Portable, mask	Tissot, nose	Portable, nose
Tissot, mask	Portable, nose	Tissot, nose
Portable, nose	Tissot, mouth	Portable, mouth
Tissot, nose	Portable, mouth	Tissot, mouth
Portable, mouth	Tissot, mask	Portable, mask
Tissot, mouth	Portable, mask	Tissot, mask

It was our original intention to study three subjects with each sequence and to duplicate the order, thus making twelve periods each morning. Such a plan would involve the use of 18 subjects. Unfortunately, the omission of a routine test on the part of one of us vitiated one of the sequences. The actual experiments with each are as follows:

I, 3 experiments II, 3 experiments III, 3 experiments  
IV, 4 experiments V, 2 experiments VI, 2 experiments

\* In this list the word "Tissot" is used instead of "respiratory-valve" for brevity.

## EXPERIMENTAL ROUTINE.

The subject came to the laboratory at about 8 A.M. in the post-absorptive condition. He then emptied the bladder, if this had not been done very shortly before arrival. After the object of the experiment and the precautions to be observed had been briefly described to him, the mask was fitted to his face, and tested for tightness. The subject usually removed coat, collar, and cravat and lay down on a comfortable upholstered couch. A stethoscope was attached to the chest over the apex of the heart and fastened by means of adhesive plaster. A Y-tube was next inserted for use with two sets of earpieces so that two observers could count the pulse auricularly and thus act as a control upon each other. After the stethoscope had been adjusted, two pneumographs were attached and tested. To avoid the use of subjects in a febrile condition, the body temperature was taken sublingually with a clinical thermometer retained for five minutes.

After the mouth temperature had been taken, the pulse rate of the subject lying quietly was recorded by one or more volunteer student observers, and in the later experiments a graphic record of the normal respiration rate was obtained from the pneumograph placed around the thorax. At the end of approximately a half hour from the time the man actually lay down on the couch, the first period for the determination of the respiratory exchange was begun. Twelve periods were then carried out as rapidly as possible according to the order determined for the morning. After their completion, the subject again emptied his bladder, had his height and naked body weight measured, and then answered a number of questions with regard to his subjective impressions, personal history, age, etc.

## STATISTICS OF SUBJECTS.

To show the character of our subjects and for comparison with other published material, the statistical data are given in table I. The first column contains the initials in the order used in the table giving the average results (table II). The second column gives the age in the year nearest to the actual time of the experiment; the third column, the height in centimeters; the fourth column, the naked body weight at the end of the experiment and after

urinating; the last two columns give the nitrogen in urine calculated on the basis of per hour and per kilogram per hour.

TABLE I. STATISTICS OF SUBJECTS IN THE COMPARISON RESPIRATORY EXCHANGE EXPERIMENTS.

SUBJECT	AGE YRS.	HEIGHT CMS.	NAKED BODY WT. KGMS.	NITROGEN IN URINE	
				Per Hour GRAMS.	Per Kilo. per Hour MILLIGRAMS.
J. A. C.	25	177	59.6	.537	9.08
C. A. C.	22	180	64.9	.585	9.00
H. H. H.	22	173	71.5	.577	8.07
T. H. N.	24	190	69.1	.380	5.50
J. F. T.	22	188	63.8	.073	—
A. G. N.	24	172	59.9	.562	9.36
J. L. G.	21	163	65.5	.460	7.02
F. S.	24	172	57.4	.504	5.30
W. F. M.	24	181	76.1	.425	5.58
S. N. G.	23	178	60.8	.408	6.72
W. J. S.	23	172	56.5	.350	6.19
C. S. B.	24	174	61.4	.408	6.64
H. O.	23	172	67.2	.870	12.95
P. G. H.	22	176	52.1	.508	9.75
C. F. M.	23	161	51.1	.204	3.99
R. K. B.	22	179	65.8	.447	6.80
H. B.	25	166	64.6	.429	6.65

It will be seen that our subjects ranged in age from 21 to 25 years, in height from 161 to 190 centimeters, and in weight from 51.1 to 76.1 kilograms. Consequently, we have a good range in both height and weight, but the data show no definite correlation between these two factors. Personal impression and acquaintance lead us to say that T. H. N. was very tall and rather lean, that C. F. M. was quite short but not extraordinarily thickset, and that H. H. H. impressed us as being somewhat heavily built. The nitrogen in the urine per hour varied from 0.073 gram with J. F. T. to 0.870 gram with H. O. We have carefully inspected the data obtained for J. F. T. and have concluded that in his case there must have been retention of urine; consequently, the real range begins at the lowest with C. F. M. with a value of 0.204 gram. The nitrogen per kilogram per hour ranged from 3.99 milligrams with C. F. M. to 12.95 milligrams with H. O. Our subjects, therefore, show somewhat wide ranges in all characteristics except age.

## METHOD OF PRESENTING AND DISCUSSING RESULTS.

The general method of presenting and discussing results is as follows:

A summary is given in table II for each of the 17 subjects, showing the average results obtained with the two respiration apparatus; the protocols of the most nearly uniform and of the most divergent set of results with individual subjects are also tabulated (see table

III). The averages of all measurements and the detailed results as illustrated by the two special examples are discussed.

The averages of all results with each breathing appliance are grouped in table IV.

The averages of the first and second measurements with each breathing appliance and respiration apparatus, together with the averages of the individual differences, are likewise considered.

The general features of the results, their correlations and their significance, are presented.

The problems concurrently investigated, *viz.*, the relation of the respiratory quotient and the oxygen consumption to the period of the day, and the necessity for the training of subjects, are considered; finally, recommendations as to use of respiration apparatus, breathing appliances, controls, and number of periods are given.

#### COMPARISON OF RESULTS FOR THE TWO RESPIRATION APPARATUS.

The averages for all the results obtained with each respiration apparatus and with each subject are given in table II. The data for R. K. B. and H. O. are given in detail in table III as examples of the best and the poorest sets of results from the standpoint of uniformity and agreement of duplicates with the various breathing appliances and respiration apparatus. The measurements which were made, and the results calculated to the per minute basis and according to the relationship of the various factors, were as follows: Carbon-dioxide elimination, oxygen consumption, respiratory quotient, average pulse rate, average respiration rate, volume of respiratory ventilation, volume per respiration, and percentage composition of expired air, *i.e.*, carbon-dioxide content and oxygen deficit.

The average carbon-dioxide elimination of all subjects with the respiratory-valve apparatus was 190 c.c. as compared with 202 c.c. with the portable apparatus, with a difference of 12 c.c., which can be regarded as a true difference. The detailed data for the two subjects, R. K. B. and H. O., show that the average carbon-dioxide elimination for R. K. B. with the respiratory-valve apparatus was 195 c.c. and with the portable apparatus 199 c.c., an excellent agreement. With H. O., on the contrary, the average was 197 c.c. for the respiratory-valve ap-

paratus and 204 c.c. for the portable apparatus, a positive difference of 7 c.c.

The average oxygen consumption with the respiratory-valve apparatus was 233 c.c. and with the portable apparatus 238 c.c., a remarkably good agreement. This agreement is corroborated by the detailed data for R. K. B. and H. O. The average oxygen consumption with R. K. B. for both the respiratory-valve apparatus and the portable apparatus was 245 c.c. With H. O. it was 230 c.c. with the respiratory-valve apparatus and 233 c.c. with the portable apparatus.

The average respiratory quotient for all of the subjects was 0.82 with the respiratory-valve apparatus and 0.85 for the portable apparatus. Considering again the two special subjects, we find that with R. K. B. the respiratory-valve apparatus gave 0.80 and the portable apparatus 0.82. With H. O. the quotients averaged 0.85 and 0.88. These differences of 0.02 and 0.03 for the two apparatus with the two subjects agree with the differences between the averages for all of the subjects.

The average pulse rate with the respiratory-valve apparatus for all of the subjects was 65 and with the portable apparatus 63—a slight but, perhaps, significant difference. With R. K. B. the average pulse-rate for the respiratory-valve apparatus was 65 and for the portable apparatus 66, while with H. O. the pulse rate for the two apparatus was 70 and 65. In other words, not only the average of all subjects but also the two special examples show that the higher pulse rate was obtained with the respiratory-valve apparatus.

The average respiratory rate with all subjects was 14.2 with the respiratory-valve apparatus and 14.5 with the portable apparatus—a difference without significance. With the subjects R. K. B. and H. O. the differences are 0.1 and 0.9, also without significance so far as respiration rates are concerned.

The average ventilation volume per minute with the respiratory-valve apparatus for all subjects was 5.26 liters as compared with 6.47 liters for the portable apparatus. With R. K. B. the volume was 4.60 liters with the respiratory-valve apparatus and 5.27 liters with the portable apparatus. With H. O. it was 5.73 liters, and 6.28 liters with the two apparatus. It is thus seen that the difference in the volume of the respiratory ven-

TABLE II. SUMMARY OF MEASUREMENTS OF THE RESPIRATORY EXCHANGE WITH 17 UNTRAINED SUBJECTS, USING THE PORTABLE APPARATUS AND A RESPIRATORY-VALVE APPARATUS.

SUBJECT, DATE AND APPARATUS	(Values per minute.)								
	CARBON DIOXIDE	OXYGEN	RESPIRATORY QUOTIENT	AVERAGE PULSE RATE	AVERAGE RESPIRATION RATE	VOLUME PER MINUTE	VOLUME PER RESPIRATION	EXPIRED AIR	
	c.c.	c.c.				liters	c.c.	CARBON DIOXIDE	OXYGEN DEFICIT
1918									
J. A. C., April 8									
Respiratory-valve	184	244	.76	67	15.5	5.71	438	3.26	4.25
Portable	216	248	.87	66	14.5	7.16	603	3.06	3.51
C. A. C., April 9									
Respiratory-valve	187	237	.79	56	17.8	6.18	419	3.06	3.83
Portable	211	245	.86	56	17.6	7.58	518	2.84	3.28
H. H. H., April 10									
Respiratory-valve	212	255	.83	54	15.5	5.70	440	3.76	4.50
Portable	227	257	.89	53	17.2	7.37	510	3.24	3.54
T. H. N., April 11									
Respiratory-valve	213	266	.80	60	12.1	5.88	592	3.71	4.60
Portable	229	278	.82	58	14.9	7.32	588	3.18	3.86
J. F. T., April 12									
Respiratory-valve	206	253	.83	67	13.5	5.33	496	3.91	4.61
Portable	217	247	.84	63	14.6	6.65	552	3.32	3.89
A. G. N., April 15									
Respiratory-valve	188	231	.82	73	11.6	5.18	549	3.68	4.49
Portable	217	242	.90	73	11.1	6.67	759	3.33	3.74
J. L. G., April 16									
Respiratory-valve	185	228	.81	67	15.5	5.10	400	3.68	4.49
Portable	198	228	.87	65	15.7	6.70	519	3.00	3.43
P. S., April 17									
Respiratory-valve	173	216	.80	66	15.4	4.76	380	3.66	4.56
Portable	170	219	.78	62	16.5	6.06	450	2.57	3.70
W. F. M., April 18									
Respiratory-valve	218	264	.83	62	14.8	6.15	505	3.58	4.29
Portable	219	268	.84	62	15.5	8.49	608	2.68	3.20
S. X. G., April 23									
Respiratory-valve	205	260	.79	75	13.7	5.28	472	3.92	4.93
Portable	198	270	.73	73	15.6	7.71	600	2.74	3.72
W. J. S., April 25									
Respiratory-valve	152	193	.79	57	17.0	4.77	346	3.23	4.05
Portable	174	202	.86	57	15.7	5.49	421	3.25	3.78
C. S. B., April 26									
Respiratory-valve	185	236	.79	72	11.4	4.83	536	3.88	4.80
Portable	222	225	1.00	73	10.5	5.92	685	3.77	3.82
H. O., April 30									
Respiratory-valve	197	230	.81	70	15.4	5.73	452	3.49	4.12
Portable	204	233	.86	65	16.3	6.28	471	3.28	3.75
P. G. H., May 1									
Respiratory-valve	196	219	.86	65	10.2	5.61	608	3.96	4.42
Portable	184	216	.84	62	9.1	4.90	606	3.77	4.49
C. F. M., May 2									
Respiratory-valve	149	181	.82	56	16.1	4.34	326	3.48	4.18
Portable	156	188	.83	54	15.1	4.80	380	3.25	4.04
R. K. B., May 3									
Respiratory-valve	195	245	.86	68	9.7	4.60	579	4.29	5.25
Portable	190	245	.82	66	9.8	5.27	653	3.80	4.56
H. B., May 6									
Respiratory-valve	177	213	.83	73	15.9	4.68	356	3.88	4.63
Portable	190	216	.86	71	16.1	5.54	419	3.49	3.96
Average with									
Respiratory-valve	199	233	.82	65	11.2	5.26	461	3.67	4.48
Average with									
Portable	202	238	.85	63	11.5	6.17	556	3.22	3.77

tilation per minute varied in the same direction, and approximately to the same degree not only with the averages for the whole group of 17 subjects but also with the two subjects who have been selected as illustrating either the greatest range of variation or the best set of results. All of the figures compared show

a lower total ventilation of the lungs with the respiratory-valve apparatus than with the portable respiration apparatus.

The volume per respiration for the average of all subjects was 464 c.c. with the respiratory-valve apparatus and 556 c.c. with the portable apparatus. With R. K. B. it was 579 c.c. with

TABLE III. PROTOCOLS OF MEASUREMENTS OF RESPIRATORY EXCHANGE WITH SIX COMBINATIONS OF RESPIRATION APPARATUS AND BREATHING APPLIANCES, SUBJECTS R. K. B. AND H. O.

SUBJECT, DATE, APPARATUS, AND TIME.		(Values per minute.)									
		CARBON DIOXIDE		RESPIRATORY QUOTIENT	AVERAGE PULSE RATE	AVERAGE RESPIRATORY RATE	VOLUME PER MUSCLE	VOLUME PER RESPIRATION	EXPIRED AIR		
		C.C.	C.						CARBON DIOXIDE	OXYGEN DEFICIT	
1918											
R. K. B., MAY 3											
<i>Respiratory valve</i>											
Mask											
8.51 a.m. ....	199	247	.80	71	9.7	5.09	654	3.93	4.86		
10.38 a.m. ....	181	234	.77	67	9.3	4.43	578	4.11	5.29		
Nosepieces											
9.29 a.m. ....	198	248	.80	71	9.9	4.20	514	4.73	5.91		
11.18 a.m. ....	197	244	.81	66	9.9	4.31	529	4.60	5.66		
Mouthpiece											
10.03 a.m. ....	197	244	.81	69	9.9	4.71	635	4.21	5.19		
11.52 a.m. ....	200	251	.80	65	10.1	4.86	584	4.15	5.17		
Average .....	195	245	.80	68	9.7	4.69	579	4.29	5.35		
<i>Portable</i>											
Mask											
9.09 a.m. ....	194	245	.79	69	9.4	5.55	716	3.50	4.41		
10.55 a.m. ....	185	239	.77	67	9.1	5.40	719	3.43	4.43		
Nosepieces											
9.46 a.m. ....	194	241	.81	66	9.9	4.82	590	4.02	4.42		
11.34 a.m. ....	203	249	.85	62	10.2	4.90	582	4.14	4.90		
Mouthpiece											
10.18 a.m. ....	201	241	.84	67	10.2	5.10	606	3.95	4.73		
12.07 a.m. ....	219	261	.84	66	10.1	5.85	703	3.74	4.46		
Average .....	199	245	.82	66	9.8	5.27	653	3.89	4.56		
H. O., APRIL 30											
<i>Respiratory valve</i>											
Mask											
9.16 a.m. ....	171	225	.76	67	16.7	5.71	416	3.02	3.94		
11.02 a.m. ....	155	230	.67	66	12.1	4.76	479	3.28	4.83		
Nosepieces											
9.54 a.m. ....	190	222	.86	70	14.2	4.87	418	3.94	4.56		
11.39 a.m. ....	179	215	.63	70	14.3	4.69	400	3.86	4.59		
Mouthpiece											
8.40 a.m. ....	248	255	.97	74	18.0	7.29	496	3.44	3.50		
10.28 a.m. ....	237	231	1.02	71	17.1	7.07	504	3.39	3.27		
Average .....	195	230	.85	70	15.4	5.73	452	3.49	4.12		
<i>Portable</i>											
Mask											
9.23 a.m. ....	175	228	.75	64	16.0	6.41	489	2.78	3.56		
11.20 a.m. ....	180	235	.77	64	16.4	6.62	492	2.72	3.55		
Nosepieces											
10.11 a.m. ....	185	237	.78	64	15.5	5.17	407	3.58	4.58		
11.56 a.m. ....	232	226	1.03	65	16.1	6.13	464	3.79	3.69		
Mouthpiece											
8.54 a.m. ....	230	238	.97	69	17.4	6.18	422	3.72	3.85		
10.42 a.m. ....	222	235	.95	65	16.2	7.17	540	3.10	3.28		
Average .....	204	233	.88	65	16.3	6.28	471	3.28	3.75		

the respiratory-valve apparatus and 653 c.c. with the portable apparatus, and with H. O., 452 c.c. and 471 c.c. The direction of the differences with the two subjects is the same as with the average of all subjects, but the amount of variance is not so great with H. O. as with R. K. B.

The percentage of carbon-dioxide in the expired air for the average of all subjects with the respiratory-valve apparatus was 3.67 per cent. and with the portable apparatus 3.22 per cent. This is a small but positive difference. With R. K. B. the percentage carbon-dioxide

content was 4.29 and 3.80 per cent. for the two apparatus and with H. O. it was 3.49 and 3.28 per cent. The difference between the portable and respiratory-valve apparatus with the two special subjects is in the same direction and of about the same order of magnitude as the difference with the average of all subjects.

The average oxygen deficit of the expired air for the whole group with the respiratory-valve apparatus was 4.48 per cent. and with the portable apparatus 3.77 per cent. This difference is more marked than that for the carbon dioxide in the expired air. With R. K. B. the de-

feit was 5.35 and 4.56 per cent. with the two apparatus and with H. O. it was 4.12 and 3.75 per cent. The direction of the difference is thus exactly the same with the two subjects, and with each there is an indication that the variation between the apparatus is greater with the oxygen than with the carbon dioxide.

With R. K. B. the agreement both as to apparatus and also as to the agreement of two successive periods with the same apparatus and breathing appliance is all that could be desired or expected in work with respiratory-exchange apparatus. It shows the possibilities with a subject who is coöperative and is not apprehensive or influenced by the conditions of the experiment in any way. It also shows that fundamentally there is no great difference so far as the character of the respiration apparatus or the breathing appliance is concerned. The factors of ventilation and composition of expired air given for R. K. B. in the last four columns of table III show distinct differences between the two apparatus on the average and these differences agree with the differences in the averages for all of the subjects. Consequently, we have to conclude that these variations are significant. Since the data in the last four columns indicate in all their relations that the ventilation with the portable apparatus and the respiratory-valve apparatus is not the same, a physiological factor is implied.

When we compare the results for R. K. B. obtained with the three breathing appliances, we find no great difference with either the portable apparatus or the respiratory-valve apparatus. The highest oxygen consumption was obtained with the mouthpiece, the next highest with the nosepieces, and the lowest values with the mask, the order in the values being the same for both respiration apparatus. The respiratory quotient followed the same general course, but the differences with the three breathing appliances are less with the respiratory-valve apparatus than with the portable apparatus. The significant fact regarding the pulse rate is that the lower results were always obtained in the second period with a breathing appliance with either apparatus as compared to those for the first period. The differences in the last four columns of the table which were apparent when the respiratory apparatus alone were considered, are also evident when the results are compared

for the various breathing appliances as used with the two apparatus.

The second subject included in table III (H. O.) illustrated the difficulty in obtaining good agreement in the measurements of all the physiological indices employed in our research. He was formerly a laboratory assistant in the Nutrition Laboratory and consequently should have had no apprehension regarding the experiment and, indeed, should have been more or less familiar with the experimental conditions and with what would be expected of him as a subject. His coöperation was absolutely satisfactory. The agreement in the results for the two respiratory apparatus was fairly good for the physiological indices. But when we consider the ranges in the values for both the apparatus and the three breathing appliances, it is evident that we have here a subject who cannot be depended upon to give a satisfactory agreement of figures in all of the measurements and calculated results possible with the technique employed in our research.

When two periods with the same breathing appliance are compared, the agreement in the values for the oxygen consumption is as good in general with H. O. as with any other subject, and there is but little choice as to breathing appliance or respiration apparatus so far as the measurement of the oxygen consumption is concerned. This fact confirms the conclusion already gained in a previous comparison of respiration apparatus, *i.e.*, that the oxygen consumption can be obtained with a fair degree of accuracy with any standard apparatus employing breathing appliances.<sup>14</sup>

From the standpoint of the measurement of either carbon-dioxide production or respiratory quotient, H. O. is hopeless as a subject. The results obtained with him bring out clearly the difficulties which are likely to occur when one attempts to determine the respiratory quotient or the carbon-dioxide elimination in short periods with a respiration apparatus employing breathing appliances. In other words, H. O. has a respiratory center which is exceedingly sensitive to mechanical or physiological obstruction in normal respiration. The two respiratory quotients with any breathing appliance and respiration apparatus which most nearly approach his average are those obtained with the nosepieces and respiratory-valve apparatus. But even in these two periods there are sev-

eral inconsistencies in the measurements — namely, the values for the carbon-dioxide elimination and the oxygen absorption are among the lowest values obtained for these factors and the pulse rate is high in comparison with the other periods. H. O. would certainly not be our first choice in selecting a subject for an exact scientific research in which measurements of changes in the amount and character of the total metabolism were involved; but he represents a type which one is quite likely to meet in clinical work, and therefore his results are of importance in showing the possible difficulty in drawing definite conclusions from one day's measurements.

The conclusions from both the averages of all the subjects with the two types of apparatus and from the detailed results of the two subjects, R. K. B. and H. O., are that the measurements of oxygen consumption agree very closely so far as any requirements regarding the measurements of basal metabolism are concerned, that the carbon-dioxide elimination is higher with the portable apparatus than with the respiratory-valve apparatus, and in consequence, the respiratory quotient is higher with the portable apparatus than with the respiratory-valve apparatus. Lastly, that all of the coincident measurements in this research, namely, the ventilation per minute, the volume per respiration, and the composition of expired air, confirm the average results for the carbon-dioxide elimination and the respiratory quotient.

#### COMPARISON OF RESULTS FOR THE THREE BREATHING APPLIANCES.

The averages of all results obtained with the three breathing appliances (nosepieces, mouthpiece, and mask) are given in table IV. In comparing these values, it should be borne in mind that man ordinarily breathes through the nose and that when he breathes through the mouth,

it is because of habit, of demand (as in exercise), or of mechanical or pathological obstructions in the nose. The breathing appliance most suitable for meeting all these conditions is the mask.

The carbon-dioxide elimination with the three breathing appliances is highest with the mouthpiece (201 c.c.) and lowest with the mask (191 c.c.).

The average values for the oxygen consumption range from 235 c.c. for the nosepieces and mask to 238 c.c. for the mouthpiece, an extremely small range.

The respiratory quotient is highest with the mouthpiece (0.85) and lowest with the mask (0.81). The average results with the mouthpiece and nosepieces agree very closely, but those for the mask show a significant difference.

The pulse rates vary but little, the average values for the three breathing appliances ranging from 64 to 65.

The respiration rate is lowest with the nosepieces, with a slight difference between this average value and those obtained with the mouthpiece and mask, the two latter averages varying but little from each other.

The respiratory ventilation per minute is lowest with the nosepieces (5.40 liters) and highest with the mask (6.36 liters). The value for the mouthpiece corresponds to practically an average of the other two. So far as the volume per minute is concerned, there is really no significant difference with the three breathing appliances which cannot be explained either by results of previous research<sup>11</sup> or by the actual dead space of the breathing appliance involved.

The volume per respiration and the composition of expired air show values which, in their differences, are fairly consistent with the measurements previously considered.

This comparison of values obtained with the

TABLE IV. AVERAGES OF ALL MEASUREMENTS MADE WITH THE NOSEPIECES, MOUTHPIECE, AND MASK.

BREATHING APPLIANCE	(Values per minute.)									
	CARBON DIOXIDE	OXYGEN	RESPIRATORY QUOTIENT	PULSE RATE	RESPIRATION RATE	VOLUME PER MINUTE	VOLUME PER RESPIRATION	EXPIRED AIR		
								CARBON DIOXIDE	OXYGEN DEFICIT	
Nosepieces	196	235	.81	64	13.8	5.40	494	3.72	4.41	
Mouthpiece	201	238	.85	64	14.5	5.52	503	3.52	4.17	
Mask	191	235	.81	65	14.7	6.36	534	3.10	3.80	

three breathing appliances therefore indicates that all of the appliances give concordant values for oxygen consumption and that the mask gives the lowest values for carbon-dioxide elimination and respiratory quotient.

(To be continued.)

## THE RECONSTRUCTION OF A GERMAN SHELL SHATTERED ARM. THE REPORT OF AN HISTORICALLY IMPORTANT CASE.

BY CHARLES L. SCUDDER, M.D., BOSTON,  
AND  
FRANCIS J. CALLANAN, M.D., BOSTON.

FROM AN historical as well as a surgical point of view, it seems well to record the cases of John Zitz and John Bogovich, two members of the crew of the tug "Perth Amboy" attacked by a German submarine off Orleans, Cape Cod, on July 22, 1918.

From an historical standpoint these cases are interesting because, as far as can be ascertained, these men, both wounded by German shells, were the first and only American casualties of the war for whom all treatment, from first aid station to base hospital, was administered by the United States. Also this attack was the only bit of the European war to be seen from American shores and during it, the only German shell of the war landed on American soil.

From a surgical standpoint they are important because Bogovich presents an unusual case of bone transplantation and also an excellent example of a septic wound treated by the Carrel-Dakin method.

At 10.15 on the morning of July 22, 1918, a bright, clear day, the tug "Perth Amboy," towing four barges partly laden with stone, was fired upon by a German submarine. From the shore, the submarine was plainly visible about three miles out with the tug and tows one mile closer in. The first shell fell short of the tug, the next two far over it, but the fourth struck the pilot house where Zitz and Bogovich were stationed. Then followed about fifty shells, the submarine firing in rotation from a gun mounted on deck at the tug and the tows. By this time the U-boat was close onto the other vessels and every shot was a hit. From the shore, there could be seen a blaze of fire followed immediately by a cloud of smoke as a shell burst against

one vessel or another. Twenty-five minutes after the first shell was fired, a seaplane appeared from the Chatham Naval Station, seven miles away; but just before it reached the submarine, the latter submerged, with its aerial masts still visible, however, giving its exact location to the aviator. He dropped a depth bomb which did not explode, circled once, and started back to his station. As he did so, the submarine again came to the surface and fired at him. This shell the aviator heard pass by him and it was this shell that landed in a small pond about one mile inland, the first German shell to land in this country.

Two of the tows had by this time gone down, and the submarine began again its interrupted work on the tug and the other two barges. Altogether the bombardment lasted between forty-five and fifty minutes, the submarine riding practically all of that time on the surface of the water. With a third barge sunk, the fourth sinking, and the tug in flames, it submerged and was not seen again. It was indeed an amazing and exasperating spectacle to those of us who were watching from the shore, just two miles away.



FIG. 1.—The tug *Perth Amboy*.

Zitz and Bogovich were brought to shore by the other members of the crew, being carried from the tug after the first shell had struck them. Zitz had a small shell wound on the outer side of his right knee but was otherwise in good condition.

Bogovich, on the other hand, in a moderate degree of shock, had a shell wound over the lateral border of his left scapula with the fragment definitely palpable just beneath the skin. His right upper arm was badly crushed with two deep jagged wounds just above the elbow.

The wounds were hastily washed at the Orleans Life Saving Station, sterile dressings applied, and the arm immobilized. Both men



were taken to the Massachusetts General Hospital. X-rays of Bogovich's arm and shoulder were taken which showed the shell fragment in the shoulder and the shattered condition of the right humerus.



FIG. 2.—Shell fragment in left shoulder, which was removed.

Bogovich was immediately anaesthetized and the shell fragment, about a three-quarter inch cube, removed from the back. The skin margins of the wounds around the right elbow were cut away, devitalized muscle and tissue removed, and many fragments of shell and bone were taken out. There was a fracture running between the condyles of the humerus, which extended into the joint. The condyles were pulled together with a ligature of kangaroo tendon, leaving a distal stump of the humerus of about one and one-half inches. The wounds were irrigated with quantities of sterile salt solution, followed by Dakin's solution, and four Carrel tubes were then inserted. The wound was treated by the routine Carrel-Dakin method of a daily dressing under aseptic precautions and bi-hourly installations of Dakin's solution. Prints below show the patient at the time he was undergoing this treatment with the special Dakin carriage beside him.

At first the wounds discharged considerable pus which cleared up rapidly under the treatment, the tubes being removed one by one as the different parts of the wounds became free

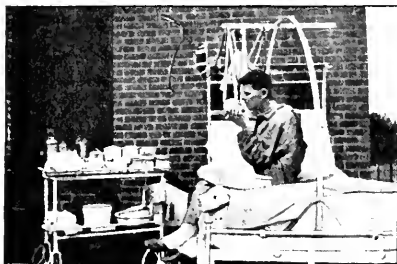
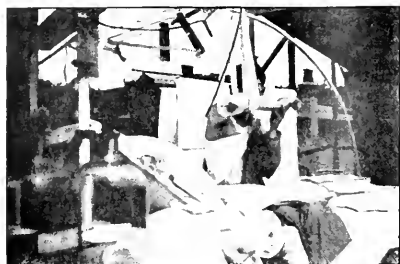


FIG. 3.—Humerus before operation.

of bacteria. The last tube was removed on August 28th, five and a half weeks after their introduction.

On October 16th, with the granulations completely covered with skin and all wounds entirely healed, Bogovich was sent from the hospital to rest for three months. His arm was at the time protected by a leather splint and a sling. The arm without the splint in position was flail because of the loss of bony substance from the lower end of the humerus.

He returned on January 25th of this year and was operated on a week later by one of us. The ends of the old fractured humerus were freed from the surrounding tissue and curetted. The medulla of the humeral shaft was opened and the distal fragment was prepared for the reception of the graft. The left fibula was exposed and six inches resected with periosteum attached. After the ends of the graft were shaped, and while maintaining traction on the arm to lengthen the gap of five inches between the ends of the bone, the graft was driven into



FIGS. 4 AND 5.—Bogovich during the period of Carrel-Dakin irrigation.

the medulla of the proximal end of the humerus and made to engage in the cavity prepared in the distal end. On letting up on the traction, the graft was firmly fixed. The wound was closed in two layers and the arm put up in plaster, superimposed on an internal right angular splint. The X-ray print below shows the arm a few days after this operation; the upper

end of the humerus indistinctly shows at the top of the print.

By overhead apparatus, the humerus was suspended at a right angle to the body and kept in this position about six weeks. X-rays taken from time to time showed the graft to be in good condition.

At the end of that time, the cast and splints were removed, stitches were taken out and another cast applied. This cast still held the forearm flexed to 90 degrees and the shoulder joint was immobilized by a plaster spica with the humerus now in its normal position. On May 3rd, the spica was removed, giving free play at the shoulder, and a simple plaster shell and sling applied to immobilize and support the elbow.

The graft was united solidly with the ends of the humerus. X-Ray shows the periosteum growing from the two ends of the humeral fragments. The patient already has about ten degrees of motion in the elbow joint. He has been receiving massage twice a week since May 1st. The size of the fibula fragment has increased as it has assumed its new function and everything points now to a strong joint with slight motion.

The case serves to illustrate the value of delay in performing a plastic bone operation until the initial sepsis has been entirely eliminated and until several weeks have elapsed to insure that



FIG. 6. Immediately after operation.



FIG. 7.—Some weeks after operation.



FIG. 8.—Latest x-ray of graft. Note security of ends of graft.

no recurrence of the infection will take place when the plastic operation is done.

In this case three months were allowed to pass before the bone plastic was done.

KANSAS UNIVERSITY MEDICAL SCHOOL.—The sum of \$200,000 was appropriated recently for the building for the Kansas University Medical School, which will be erected provided the City of Rosedale furnishes the additional ground needed, which is valued at \$60,000.

## A GRAPHIC METHOD FOR RECORDING CONJUGATE DEVIATION TESTS, AND ITS USE, ILLUSTRATED BY A CASE RECORD.

By EDWARD A. TRACY, M.D., BOSTON.

This brief paper serves two purposes. It illustrates a graphic method (the writer's) of recording the condition found when testing for conjugate deviation of the eyes, and it publishes a bit of research work upon which is based the finding that conjugate deviation when found in epilepsy is not a constant, *i.e.*, unchangeable condition.

The writer heard Bárány state, in 1914, that the normal positions of the eyes when closed are (1) looking upward, (2) diverging, (3) converging; if both eyes look to the left or to the right, the positions are respectively conjugate deviation to the left and conjugate deviation to the right, and are abnormal. Bárány also stated that conjugate deviation is due to an increase of supra-nuclear tonus, and that the centres for motion of the eyes are in the cerebral cortex.

The writer, following Bárány's instruction, tests for conjugate deviation by having the patient look at him, and then telling him to close the eyes and keep them closed, not too firmly, while the writer with his thumbs gently but firmly pushes up the patient's upper eyelids, thus disclosing the position of the eyes. The positions in which the eyes are found are denoted by the following symbols:

- ⊥ denotes that the eyes look upward (normal)
- ∖ / denotes that the eyes diverge (normal)
- ∕ ∖ denotes that the eyes converge (normal)
- ∕ ∖ denotes that both eyes look to the *patient's* left, hence conjugate deviation to the left (abnormal)
- ∖ ∖ denotes that both eyes look to the *patient's* right, hence conjugate deviation to the right (abnormal)

Each line of the symbols represents the line of motion the eye (or rather the cornea) travels from its position at the lower end of the line (with the eyes open) to its position at the upper end of the line, the latter being the position in which the eye is found on gently forcing upwards the upper lid in making the test. An advantage of the graphic method of representing the conditions found is that it permits of the speedy recording of conditions, evidently abnormal, yet not specifically so designated here-

tofore. For example, the symbol  $\nearrow$  denotes that the right eye was found to look upwards and the left eye to look to the left, a condition not accurately described as divergence, since the left eye did not diverge in its line of motion, but kept straight upward.

The following record in which these symbols are used to denote the positions of the eyes as found in testing for conjugate deviation, is taken from notes of observations made in a case of idiopathic epilepsy. The patient, H. D., is aged 17 years. The record includes observations made between August 15, 1916, and December 5, 1916. The interesting feature of these observations is that they record graphically the change of a conjugate deviation to the left to a normal position of divergence, the change occurring quite gradually after a preliminary sudden change on October 14, 1916. There appears to have been a period of vacillation between October 15 and December 5 (1916), when the condition of divergence became established, insofar as the condition of divergence has remained the same up to the present time, June 28, 1919.

Record of the conjugate deviation tests made in case of H. D.:

Aug. 5, 1916,	6.00 P.M.	Eyes	//	(Conjugate deviation to left)
Aug. 31,	10.30 A.M.	"	//	
Sept. 3,	12.00 M.	"	//	
Sept. 13,	11.00 A.M.	"	//	
Sept. 23,	11.45 A.M.	"	//	
Sept. 24,	12.45 A.M.	"	//	
Sept. 25,	12.30 P.M.	"	//	
Sept. 26,	12.00 M.	"	//	
Sept. 29,	10.00 A.M.	"	//	
Oct. 2,	7.00 P.M.	"	//	
Oct. 4,	7.00 P.M.	"	//	
Oct. 7,	1.00 P.M.	"	//	
Oct. 8,	11.30 A.M.	"	//	
Oct. 10,	7.30 P.M.	"	//	
Oct. 11,	2.00 P.M.	"	//	
Oct. 12,	2.00 P.M.	"	//	
Oct. 14,	9.15 A.M.	"	$\searrow$	(Divergence)
Oct. 15,	7.00 P.M.	"	//	
Oct. 16,	7.30 P.M.	"	//	(Eyes to left, right eye less so than left)
Oct. 17,	12.30 P.M.	"	//	
	7.00 P.M.	"	//	
Oct. 18,	7.00 P.M.	"	//	
Oct. 19,	1.00 P.M.	"	//	
Oct. 20,	9.00 A.M.	"	$\searrow$	(Divergence)
	7.00 P.M.	"	//	
Oct. 21,	10.30 A.M.	"	$\searrow$	
Oct. 22,	10.30 A.M.	"	$\searrow$	

Oct. 23, 1916, 9.00 A.M. Eyes  $\searrow$

7.00 P.M. "  $\searrow$

Oct. 24, " 7.00 P.M. "  $\searrow$

(The eyes diverged similarly till November 26, when the left eye diverged less strongly than the right, as is shown by the symbol.)

Nov. 26, 1916, 9.00 A.M. Eyes  $\searrow$  (Divergence)

Nov. 28, " 9.00 A.M. "  $\searrow$  (Divergence)

7.30 P.M. "  $\searrow$  (Left eye looks upward)

Dec. 3, " 8.45 A.M. "  $\searrow$  (Left eye looks upward)

Dec. 4, " 9.00 A.M. "  $\searrow$  (Left eye looks upward)

7.00 P.M. "  $\searrow$  (Divergence)

Dec. 5, " 8.45 A.M. "  $\searrow$  (Left eye looks upward)

7.00 P.M. "  $\searrow$  (Divergence)

## RESULT OF THE EXAMINATION OF THE PROSTATE AND VESICLES IN 125 CASES WITH NEGATIVE VENEREAL HISTORY.

BY GEORGE GILBERT SMITH, M.D., BOSTON,

AND  
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[From U.S.A. General Hospital No. 9, Lakewood, N. J.]

At General Hospital Number 9, Lakewood, N. J., cases of arthritis were examined by the Urological Service to determine whether or not a focus of infection existed in the genito-urinary tract. It occurred to the writers that the result of the examination of the prostate and seminal vesicles in this group of patients might be of some interest as establishing the frequency with which evidences of infection may exist in the genitalia of those men who have never had gonorrhea.

Of the patients whose examinations are recorded, 107 were men between the ages of 20 and 30; 15 were between 30 and 35, and three were older than 35. In this study, age seemed of no importance. The men were questioned carefully as to the possibility of a past infection. Of the 388 men examined, there were only 150 who denied venereal disease. This fact, reinforced by our own impressions of the honesty of the men, leads us to the opinion that the truth was told in all but perhaps a very few instances.

### ROUTINE OF EXAMINATION.

The external genitalia were examined for the presence of discharge and for abnormality of the scrotal contents. The urine was inspected

for turbidity or shreds. Palpation of the prostate and vesicles was done with the bladder empty. The secretion expressed by massage was caught on a slide, dried, fixed in the flame, stained with Loeffler's methylene blue and examined under the oil immersion lens. The number of polymorphonuclear leucocytes in 10 fields was counted and the average number per field determined. In doing this it was our endeavor to select areas where the secretion was thickest, so that the figures might not underestimate the facts.

#### RESULTS OF EXAMINATION.

Of the 125 cases with negative venereal history comprising our series, prostatic massage produced no secretion at all in 18. In 72, the secretion expressed showed no pus at all. In 10 cases, the count showed an average of 2 leucocytes or less per field. These cases we have arbitrarily considered as not showing sufficient evidence of infection to be called examples of "prostatitis." Thirteen cases gave a count of more than two leucocytes per field. Their records follow:

NO. OF CASES	AVERAGE NUMBER LEUCOCYTES PER OIL IMMERSION FIELD
5 .....	12.0
7 .....	6.1
30 .....	2.2
41 .....	10.8
57 .....	8.0
69 .....	9.0
71 .....	4.0
77 .....	Too numerous to count
81 .....	8.0
82 .....	"Large amount of pus"
84 .....	3.0
106 .....	5.0
120 .....	4.0

We believe that these cases may be said to have prostatitis or vesiculitis. In none of them was the examiner able to say, on the evidence of palpation, whether the prostate or the seminal vesicles were chiefly concerned. Throughout the study, we were impressed by the unreliability of the information gained by palpation alone. Many cases who proved to have no pus in the secretion had hard prostates or distinctly palpable vesicles. Others, whose secretion contained much pus, had soft prostates and vesicles which certainly did not feel indurated. It is perfectly possible that the cases with indurated vesicles or sclerosed prostates, but with no pus in the secretion, have at some time had an infection, and that this infection has died out, leaving scar tissue.

Five cases gave a history of orchitis of

mumps. We have not included these among the preceding cases.

CASE 2. Age 29. Mumps affecting the left testicle, 1 year ago. Venereal disease denied. Has had arthritis, which is now cured. External genitalia normal. Urine clear. Prostate soft, secretion easily expressed. Vesicles not distinguishable. Secretion shows pus cells per oil immersion field as follows: 28, 19, 33, 31, 47.

CASE 60. Age 27. Complaint—Pain in back. Mumps involving left testis in February, 1918 (one year ago). Testis was swollen for 2 months. Denies venereal disease. Examination shows no atrophy of testicle. Prostate and vesicles not remarkable. Secretion: 3 leucocytes in 10 fields.

CASE 114. Age 26. Rheumatism for past two months. Venereal disease denied. Mumps when 15 years of age. He thinks that both testes were affected slightly. Examination: Right testis soft and half the size of the left. Prostate small. Vesicles hard and sharply outlined, especially the right one. Secretion: some spermatozoa. One leucocyte in 10 fields.

CASE 116. Age 20. Arthritis. Venereal disease denied. Had left orchitis of mumps, in childhood. Right testis normal, left one is small and half the size of the right testicle. Prostate and vesicles small and soft. No pus in the secretion.

CASE 121. Age 24. Arthritis. No venereal history. Left orchitis due to mumps one month ago. No abnormality of left testis now. Urine slightly turbid. Prostate and vesicles rather hard on palpation. Secretion: No pus cells.

Of these 5 cases of orchitis due to mumps, 2 showed atrophy of the testicle. In case 121, the orchitis was too recent for atrophy to have resulted. One case (case 2) exhibited pus in the secretion from prostate and vesicles. Induration of prostate and vesicles in two other cases (114 and 121) was suggestive of an inflammatory process in the past. The thought suggests itself that orchitis of mumps may sometimes be a factor in the causation of a non-gonococcus infection of the vesicles.

There were some half dozen cases presenting features worthy of special mention.

CASE 62. Age 24. Complaint, pain in legs. Denies venereal disease. Says that he has had

his prostate massaged a number of times "because the notion took him." Examination shows that the prostate contains a number of indurated areas. The vesicles are palpable. The secretion, small in amount, consists of clumps of pus and epithelium. The case is evidently one of low grade infection of prostate and vesicles, cause unknown.

CASE 88. Negative save for the presence in the secretion of one clump of pus cells containing about 20 leucocytes.

CASE 99. Negative save for the the presence in the secretion of one clump of pus cells containing about 100 leucocytes.

These two cases are quoted simply as a matter of record, as no deductions can be drawn from them.

CASE 89. Age 23. Arthritis. Venereal disease denied. No history of orchitis. Left testicle only half the size of the right; it appears to be atrophied. Urine clear. Right vesicle plastered onto the pelvic wall. Secretion: 20 pus cells in 10 fields. The findings in this case point to a chronic infectious process, etiology unknown.

CASE 93. Age 29. Prostate and vesicles hard, suggesting an old inflammatory process. Secretion: spermatozoa. No pus.

CASE 110. Right vesicle plastered onto pelvic wall. No pus in the secretion.

CASE 117. Vesicles feel like cords. No secretion expressed.

The last three cases (93, 110 and 117), characterized by induration of the vesicles without pus in the secretion, probably owe this condition to infection, now a matter of past history, which has burnt itself out.

If we include all the cases noted in our records as having had no venereal disease, we find that 16 cases out of 125 showed more than 2 pus cells per oil immersion field and might therefore be said to have prostatitis or vesiculitis. Cases with indurated vesicles but with no pus in the secretion are not included. In this series of 125 cases, therefore, about 13% of the men who had no venereal disease, showed definite signs of a prostatitis or vesiculitis. In practically all of these there were no symptoms referable to the prostatic condition, nor did it seem, in any of these cases, as if their arthritis was due to infection from this source.

## American Medical Biographies.

### CABOT, ARTHUR TRACY (1852-1912).

Arthur Tracy Cabot was born in Boston January 25, 1852, third son of Dr. Samuel (q. v.) and Hannah Jackson Cabot. The families of which his parents were members were and are deservedly prominent. Strict integrity characterized them both, but in many qualities they widely diverged. The Perkins-Cabot is sporting blood. The Jacksons are far from being devoid of enterprise, but perhaps their most salient mark is a sense of duty combined with clear intelligence. Arthur Tracy Cabot's great grandfather, Thomas H. Perkins, was second to none of his day as a merchant. No active port was a stranger to his ships, though he gradually concentrated on the China and India trade. In one of his letters early in 1800 he says in substance: "There is great risk in our business, but it would not be so interesting if there were not."

Cabot had a sub-twist ancestry, Scotch, Irish, English, Norman, French (Chabot, Isle of Jersey) blood mingling in his veins. In him the contrasted qualities of his parents were harmoniously united to a remarkable degree. Ardent and impulsive, he was yet rationally cautious. He valued the opinion of others and weighed it, but reached his own conclusions, which were nearly always sound, and then fearlessly followed. If he was or seemed prejudiced, the cause was apt to lie in his hatred of injustice and moral obliquity. No form of apparent self-interest ever swayed his decision.

He took his A. B. at Harvard in 1872, his M. D. in 1876, and served a year as surgical interne at the Massachusetts General Hospital. He then went abroad, giving special attention to surgical pathology, but neglecting no opportunity of laying a firm foundation in all pertaining to the healing art.

So many sided was his life that clearness and justice alike seemed to warrant separate treatment of the man, the surgeon, and the public servant.

Of Arthur Cabot, the man, I have already spoken somewhat. It remains to add that it is hard to think of a manly outdoor sport which he did not enjoy and enter into as far as he could without neglect of duty. Exercise in the saddle, riding to hounds, polo, fishing and shoot-

\* From the forthcoming "American Medical Biography," by Dr. Howard A. Kelly and Dr. Walter L. Barrage. Any important additions or corrections will be welcomed by the authors.

ing, yachting, golf, tennis, and squash. Of art he had a deep love and appreciation, collecting a few very choice pictures without the aid of experts, so-called. He sketched in water colors, was an active trustee of the Boston Museum of Fine Arts, and officially concerned with the Fogg Art Museum at Cambridge. His diversified interests, elevation of character, and real warmth of heart made him more and more sought after socially. A certain grimness of manner wore smooth in later life, unless stimulated by contact with what he deemed unworthy.

Cabot's training for professional life antedates the general adoption of Listerism, *i. e.*, clean surgery, an outgrowth of the work of the great Pasteur. His interest in surgical pathology has been mentioned. After his father's death, he and his brother, Samuel, founded at the Massachusetts General Hospital the Samuel Cabot Fund for Pathological Research. The income of this fund provided that a pathologist be on hand on operating days at the hospital, and make such examination as the surgeon may require to determine the scope and character of his operation. If not the first, it was surely an early effort to make thorough pathological study go hand in hand with the operation. In London he heard Lister's inaugural address at King's College, and ever after kept on the crest of the advancing wave of clean surgery. On his return in 1877, he took up general practice. The experience thus gained can be safely said to have harmed him neither as a man nor as a surgeon. Without this developmental training it may be well questioned whether he would have been able to perform the great public service of his later years, of which more below.

Increasing surgical work at the Carney, Children's, and Massachusetts General Hospitals successively compelled him, after about ten years, to confine himself to surgery. He was visiting surgeon at the Massachusetts General Hospital from 1886 to 1907. Dr. Henry J. Bigelow early recognized Cabot's quality and made him his heir in bladder surgery.

It appears that Cabot did the first successful abdominal operation within the Massachusetts General Hospital in 1881 on a case of strangulated umbilical hernia. He had assisted his father in 1874 and 1875 in two abdominal operations on hospital patients, though not within the hospital walls. He became the leading genito-urinary surgeon in New England, while second to none anywhere. He always remained a gen-

eral surgeon. As a general surgeon he was eminent; as a genito-urinary surgeon, pre-eminent.

From 1885 to 1896 he was clinical instructor, and then instructor in genito-urinary surgery in the Harvard Medical School, and would undoubtedly have gone to the top on his merits had he not been chosen Fellow of the University in 1896. The President and Fellows of Harvard, generally known as the Corporation, are seven in number, including the President and Treasurer *ex officio*. They may be roughly compared to the United States Senate; the Overseers, elected by the Alumni for six year terms, being the House. All important academic questions need concurrent action by the two governing boards, but the management of the funds rests entirely, and much of the initiative lies, in the hands of the Corporation. The varied interests and the responsibility involved, the wisdom and devotion required go without saying. He was president of the Massachusetts Medical Society in 1905 and 1906, and did much to excite the active interest and participation of the profession in the crusade against tuberculosis. He was appointed in 1907, by Governor Guild, a trustee of the State Hospitals for Consumptives, was elected chairman, and threw himself heart and soul into the work. Three hospitals were admirably built and equipped in wisely selected sites, within the appropriation, at a cost of about seven hundred dollars a bed. His interest was enlisted in school hygiene. He was associated in the Congress for School Hygiene in London in 1907, was a prime mover in the organization of the American School Hygiene Association in 1908, and in the holding of the fourth Congress in Buffalo in 1913, serving as Chairman of the Executive Committee of Arrangements. His modesty was on a par with his efficiency and devotion. In 1910 he retired from all practice that he might give himself up to wider activities. During thirty years he published over one hundred and twenty papers, the last, in the *Atlantic Monthly* for November, 1912, a plea for the prevention and treatment of tuberculosis in childhood. He was a prized member of many medical societies and of the American Academy of Arts and Sciences. This is a meagre account of the life of one foremost as a man, a surgeon, a citizen. In each capacity *totus, teres atque rotundus*. A rarely balanced youth was trained professionally before scientific progress had made it nigh inconceiv-

able that an active surgeon should lay aside his knife for the kind and quality of work to which Cabot's last years were devoted. He died November 4, 1912, leaving a widow, Susan, daughter of the late George O. Shattuck, and a memory, sweet to his friends, stamped on a grateful community.

FREDERICK C. SHATTUCK, M.D.

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## Book Reviews.

*Nerve Control and How to Gain It.* By H. ADINGTON BRUCE. New York and London: Funk & Wagnalls Company, 1918.

In response to numerous requests for the publication in book form of a series of daily talks by Mr. Bruce which appeared in the *Associated Newspapers*, this volume has been arranged in some fifty odd chapters, in each one of which a certain phase of the subject of nerve control is discussed. In a very informal way the subject is presented and is not tiresome nor too technical reading for those who may need the assistance of such a book. It is the author's intention that this be simply a series of helpful suggestions which may be followed in every-day life by persons who are not nervous as well as by those who are the victims of "nerves." The book has been designed only to be of incidental assistance and does not presume to discourage reliance on expert medical advice. Helpful suggestions concerning food, exercise, habits, worry, timidity, the value of a right outlook, the value of fresh air as a curative, exercise for nerve control, causes of fatigue, mental gymnastics, habits that hurt, etc., are among the many practical discussions. The book should prove helpful to many.

*The Child's Unconscious Mind.* By WILFRED LAY. New York: Dodd, Mead and Company, 1919.

By describing the elements of the unconscious mind and explaining its effects on the life of the individual and his adaptation to his environment, the author of "The Child's Unconscious Mind" hopes to give parents and educators insight into the complexes of the human organism and to enable them more intelligently to guide the mental activities and development of children. The relations between the child, his school work, the teacher, and the parent are of vital concern. The author of this book believes that present day education fails to recognize the importance of the unconscious mental life, and offers reasons to show that it is through this channel that those

who are entrusted with the care of children can most powerfully influence them and best assist them in adapting themselves happily to their surroundings. He describes the attitude of the child toward work, and illustrates it by examples of the constant satisfaction of unconscious wishes. Psychoanalysis, whether practised by the physician or by the educator, aims to alter the physical environment, to amplify consciousness, to remove unconscious fear, and to sublimate the unconscious desires. How this can be accomplished is illustrated by many examples of the working of the unconscious mind and its effects upon the life and development of the individual. This presentation of the subject will be of interest to all who have any responsibility in the bringing up of children.

*Tuberculosis of the Lymphatic System.* By WALTER BRADFORD METCALF, M.D. New York: The Macmillan Company, 1919.

The possibility that glandular tuberculosis appearing in childhood may be the cause of adult pulmonary tuberculosis is becoming recognized by the profession. This volume, "Tuberculosis of the Lymphatic System," emphasizes the importance of this view and urges early and proper prophylactic methods of prevention. The book presents an anatomical résumé of the most important glandular chains and areas of lymphatic drainage of the head and neck. Physiological considerations, including the composition, circulation, and the formation of lymph, and the function of the lymphatic vessels and the lymph glands are discussed. Several varieties of tubercle bacilli, including the *humans*, *bovis*, *avium*, and *piscium* types of *bacillus tuberculosis* are considered; and other factors bearing upon the etiology of the disease, such as general and hereditary predisposition to the disease, previous diseases, and the influence of environment, age, and site are explained. In a discussion of the relation between serofulosis and tuberculosis, the author comments upon the views of Cornet, Virchow, Escherich, Czerny, Heubner, Salge, Hochsinger, Saltman, and Eustace Smith.

The pathology of the disease, with a discussion of various modes of infection, is considered, and the symptomatology, prognosis, and diagnosis of tuberculosis of the lymphatic system are discussed. X-Ray therapy, surgical treatment, and heliotherapy are considered; but perhaps the most valuable contribution which this book makes in the treatment of tuberculosis is the section dealing with tuberculin. The reasons for the apparent failure in the past of tuberculin in the treatment of tuberculosis are considered, and those conditions are contrasted with modern methods of administering tuberculin and the results obtained through its use.



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## THE DECLINING BIRTH-RATE IN GREAT BRITAIN.

IN recent issues of the JOURNAL we have commented upon the declining birth-rate in England. *The Medical Press* has likewise pointed out the gravity of the British situation. An article recently published in that journal seeks to arouse the British public, as it has been awakened to the perils of venereal diseases, to a recognition of the facts and their significance. The menace from venereal diseases has been arrested by an outspoken declaration of things which have hitherto been spoken in whispers. In the meantime, the steadily declining birth-rate has been noticed with scarcely more than comment.

The statistics just issued by the Registrar-General have shown, for the first time in the history of these returns, a death-rate which has exceeded the birth-rate; and this is true in spite of the fact that the decreasing death-rate has indicated an improvement in the national health. Nor can this be explained

through neglect of motherhood and child welfare. The truth must be recognized: that the conscious limitation of families to small proportions has become the rule. At first introduced by the wealthy classes because of social and other duties, this custom has spread to the middle and lower classes, mainly through economic reasons. In some cases, the parental instinct is subordinate to the desire for freedom to indulge in pleasures: young boys and girls are sent to boarding schools in order that their parents may be relieved of the responsibility of caring for them. It is a regrettable fact that the children of working people are deemed an encumbrance by the employers, and young children are often excluded by landlords from homes and lodgings. It has been observed that the casualty lists have shown how often the son has been the only one in the family.

In order to emphasize the sinister aspect of the declining birth-rate with reference to war, attention is called to the fact that in France, with a total area of 207,016 square miles, there was, in 1911, a population of 39,601,509; while in Germany, with an area of 208,780 square miles, there was, in 1910, a total population of 64,925,993, of whom 32,071,967 were males. Had France fought Germany alone, her inferior numbers would have been to her decided disadvantage. These figures should arouse the British nation to a consideration of the probable outcome at the end of a half century if its birth-rate continues to decline.

## MEDICAL AND SURGICAL CARE OF INDUSTRIAL WORKERS.

AN investigation of one hundred and seventy industrial establishments in the East and Middle Western States, for the purpose of determining the medical and surgical facilities for the care of workers, has been reported in Public Health Bulletin No. 99. The personnel, equipment, activities, methods, and record forms necessary to the care and relief of sick and injured industrial workers and the prevention of sickness have been observed.

The value of medical service to industry is measured principally by its effects on production, and consequently, its power to prevent sickness and undue loss of time from injuries.

In order to accomplish this, one of the first requisites is a safe, healthy place in which to work. Nearly all manufacturing concerns have safety men, who are responsible for the removal of insanitary and unhealthy, as well as unsafe conditions. One hundred and eighteen of the establishments visited have in their employ whole or part-time physicians; twenty of these are connected with the safety work.

In considering the health and body hazards in industry, it is important to reduce elements of danger to a minimum, and so far as possible to consider the physical and temperamental limitations of employees. Industrial physicians can, through physical examinations, assist the employer in the equitable distribution of work. He protects the workers from communicable disease by making it understood that anyone who does not feel well, or on whom there is a breaking out, should report for a diagnosis. In many cases, employers are responsible for certain industrial diseases as well as injuries, and the industrial physician can assist the sick and injured employees to an early recovery.

The physician can illustrate medical and dental prophylaxis by practical demonstrations applied in the treatment of those trivial ailments for which people often do not seek professional advice. Physicians are also in a position to suggest menus that may be adopted by the restaurants and cafeterias often established for the men. In the matter of rest and recreation, it is for the physician to determine which employees show the greatest need of it, when and how long it should be, and, if it be exercise, what kind is most beneficial. Instruction in the prevention of sickness offers great opportunities for preventive medicine. It must be recognized that mental worries, as well as physical ailments, absorb the workman's attention. It is to the physician that the workers feel most free to confide their troubles; because of this feeling, doctors have opportunities of assisting men in difficulties of which the employer would know nothing.

There seem to be four classes of physicians in industries: those who have taken up industrial service as an expedient and for the sake of the money it pays them, those who are qualified and are making industrial medical service their life work, and those who are in the industries as a means of establishing themselves in surgery or general practice. In choosing physicians, it is necessary that employers ex-

ercise every care to select men who are thoroughly competent, not only in details and routine work, but also in administrative capacity.

#### CARE FOR BLIND SOLDIERS.

The problems involved in the care of the blind, the courage which these men show, and the attitude which the public should adopt, are a few of the subjects commented upon in Volume VIII, No. 4, of the *American Journal of Care for Cripples*. Sir Arthur Pearson, in his article, "Victory Over Blindness," describes the resolute, determined, and cheerful men who have come under his care at St. Dunstan's in England. This institution for the care of the blinded soldiers is situated in the heart of London, yet is surrounded by sixteen acres of land, which open into six hundred and fifty acres of Regent's Park. There is room for workshops and classrooms, and for such opportunities as poultry farming. Approximately seven hundred men are now employed as a result of their training, and as many more are still receiving instruction at this institution.

In order to make it possible for the blinded men to recover their power of locomotion, the floors of St. Dunstan's are carpeted and covered with linoleum pathways running in every direction. On the grounds, pathways of wire and handrails are used as guides until the men regain their confidence. Men gifted with the power of description regularly visit St. Dunstan's, describe the surroundings, and teach the men to visualize. The word *afflicted* is never used, and the men are proud and happy in what they are achieving. The classrooms are equipped with about two hundred and fifty tables, at each of which sit a man who is learning and a woman who is teaching him. The men are taught the Braille system of reading and shorthand, typewriting, massage, basket-weaving, cobbling, and carpentry work. The blinded soldiers are also taught to play again. They learn to dance, play cards, debate, row, swim, and give concerts and entertainments.

In America, the blinded soldier is cared for by the Government at Evergreen, United States General Hospital No. 7. This institution has the double function of a hospital and training school, and is described by James Bordley, Lieutenant-Colonel, M. C., U. S. A. The hospital is situated in Baltimore, on a beautiful

estate loaned by Mrs. T. Harrison Garrett. The main house is used as a hospital and rest house, and its wards are bright and airy. Besides the original buildings, there have been constructed by the Army eleven large buildings which include barracks, shops, a school, and facilities for manual training, recreation, gymnastics, and swimming. The men are taught how to be blind, and to regard themselves, except for the loss of sight, as normal men for whom the observance of the usual conventions of life and association with normal people are necessary. It is recognized that the development of the proper mental attitude is essential to success, and this aspect of readjustment is considered, as well as vocational reëducation.

Eugene Brioux, in his article, "Educating the Public in the Interest of the Blinded Soldier," reminds us that in serving the blind, we must not make them suffer by offering them pity and charity where help and intelligent assistance are needed; we must give them no more protection than they need, and sufficient kindness to help the blind without making them aware of it.

### MEDICAL NOTES.

#### THE RED CROSS AND THE RURAL COMMUNITY.

—Plans for the development of the Home Service activities of the Red Cross have been outlined in a recent issue of *The Red Cross Bulletin*. Of the 3,700 Home Service Sections, 2,906 are in places having a population under 8,000. In promoting social welfare among urban communities it has been found that schemes which work out well in cities are not always adapted to country districts. The Bureau of Rural Organization has therefore been created in the Red Cross Department of Civilian Relief, of which Professor E. L. Morgan, of the faculty of the Massachusetts College of Agriculture, has been appointed director. Professor Morgan believes it to be of first importance that the people of a community be led to come together to study local problems with the help and education of various organizations, boards, and institutions. Red Cross workers will help as far as possible in formulating a definite program of work, and will also endeavor to assist the community in getting in touch with other sources of help. The rural community is looked upon as being only a part of a chain

of development; some problems can be met only on the basis of a county or a state. In most counties, for instance, there may be found a number of county-wide organizations working with the various towns of the county. It is the purpose of the Red Cross to promote such development of the local community and the county as will bring about as rapidly as is feasible permanent development of rural affairs.

#### INFLUENZA IN SASKATCHEWAN, CANADA.—

Preliminary mortality figures covering the epidemic period from September, 1918, to March, 1919, indicate the prevalence of influenza in the Province of Saskatchewan, Canada. A recent issue of the *Public Health Reports* states that a total number of 4,322 deaths were reported, a figure higher than Saskatchewan's loss in the war. The greatest number of deaths occurred between the ages of twenty and twenty-nine years. From the standpoint of occupation, it was observed that most deaths occurred among the farmers. Where influenza was the primary cause of death, there were 3,263 deaths, or 75 per cent. of the total number of deaths. Pneumonia was by far the most fatal complication. There were only fourteen towns in which no deaths were reported, and there was less influenza in the rural than in urban communities. Reported cases indicate that the greatest number of deaths occurred on the seventh and tenth days.

#### BUREAU OF NAVIGATION.—

The Bureau of Navigation has issued the announcement that commanding officers are authorized to transfer to the regular Navy to serve the unexpired portion of his enrollment any man, at his request, in the Naval Reserve Force, whether now on active or inactive duty, who is not more than forty-five years of age, who had performed active service during the war, and who will have not less than one year to serve in the regular Navy after such transfer. Reserves so transferred will receive the same pay, rights, privileges, and allowances in all respects as now provided by existing law for men regularly discharged and reëndlisted within four months upon expiration or full four years enlistment.

NATIONAL TUBERCULOSIS ASSOCIATION.—The following facts about tuberculosis have been

collected by the National Tuberculosis Association. This disease alone annually causes 150,000 deaths in the United States. It is generally believed that infection takes place during childhood as a result of carelessness or ignorance of the nature of the disease and the methods of avoiding infection. The official records of the war department show that almost 100,000 men were rejected because they were suffering from tuberculosis. The disease has increased greatly in Europe during the war with the increasing shortage of food. Plans are now being formulated for carrying on a campaign during the months of October, November, and December, to culminate in a Red Cross Christmas Seal Sale of unusual proportions.

RESEARCH DEFENSE SOCIETY.—At the annual meeting of the Research Defense Society, held on June 26 at the house of the Medical Society of London, the progress which has been made in experimental medicine during the war was discussed. *The British Medical Journal* states that Sir Anthony Bowlby, K.C.B., in commenting upon experimental medicine and the sick and wounded in the war, expressed his belief that the British Army had been the healthiest of all the armies engaged and that its sick wastage had been less than that of other countries. He spoke of the value of prophylactic inoculation against enteric fever, and of antitetanic inoculation. The ratio of cases of tetanus in September, 1914, was six times as high as it became in November, and nine times as high as it became in December. Other investigations resulted in collecting valuable information about gas gangrene, and about the dissemination of trench fever through experiments on British and American volunteers. As a result of studying the problem of dysentery, both the amoebic and the bacillary form, it was found possible to prevent spread and to expedite cure.

APPOINTMENT OF DR. ADAMI.—Dr. J. G. Adami, who has been director of the Department of Pathology at McGill University, has been appointed vice-chancellor and principal of Liverpool University and will sail for England on August 20. Dr. Adami will be succeeded by Dr. H. Oertel, who received his degree of Doctor of Medicine from Yale University in 1894.

#### BOSTON AND MASSACHUSETTS.

BROOKS CUBICLE HOSPITAL.—The Brooks Cubicle Hospital is being erected on Summit Avenue, Brookline, adjoining the Brooks Hospital on Corey Hill, for the care of pneumonia patients. It is to be a temporary structure, to be completed in about a month, and will care for twenty patients. The building has two wings, each with five cubicles. Dr. Thomas M. Durell of Somerville is to be chief of the staff, and Miss Elizabeth Felton will have charge of the nurses.

WEEK'S DEATH RATE IN BOSTON.—During the week ending August 16, 1919, the number of deaths reported was 149 against 193 last year, with a rate of 9.75 against 12.83 last year. There were 31 deaths under one year of age, against 37 last year.

The number of cases of principal reportable diseases were: Diphtheria, 22; scarlet fever, 16; measles, 4; whooping cough, 14; typhoid fever, 4; tuberculosis, 44.

Included in the above were the following cases of non-residents: Diphtheria, 4; scarlet fever, 8; whooping cough, 1; tuberculosis, 5.

Total deaths from these diseases were: Diphtheria, 1; tuberculosis, 13.

This is the lowest week since July 16, 1904, when there were 142 deaths.

#### NEW ENGLAND NOTES.

NEW ENGLAND WAR RELIEF FUNDS.—The French Orphanage Fund has reached a total amount of \$510,838.19, and the Italian Fund, \$301,159.36.

Subscriptions to the amount of \$180,562.66 have been acknowledged by the New England Branch of the American Fund for French Wounded for the American Memorial Hospital.

VITAL STATISTICS OF NEW HAMPSHIRE.—That the influenza epidemic had a marked effect on New Hampshire's population is shown by a statement recently issued by the secretary of the Board of Health. In 1918 there were 9612 deaths in New Hampshire, a number which is within 23 of the total number of births. In 1917, births exceeded deaths by 2103. The effect of the war on marriage is shown in the fact that there were but 3,793 marriages in 1918, fewer by 815 than the number in 1917.

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## The Massachusetts Medical Society.

### MEETING OF THE SECTION OF HOSPITAL ADMINISTRATION, JUNE 4, 1919.

#### THE STATE CLINICS FOR THE TREATMENT OF VENEREAL DISEASES.

By EUGENE R. KELLEY, M.D., BOSTON.

*Massachusetts State Commissioner of Health.*

THE Massachusetts program against venereal diseases has now been in operation somewhat over a year. Gonorrhea and syphilis were made reportable diseases on December 18, 1917, to take effect February 1, 1918. The question of requiring these diseases to be reported had been carefully studied by the Department for fully two years prior to this action. It was the unanimous opinion of the Public Health Council and the executive staff that these diseases should not be made reportable until the Department was in a position to perform definite service in behalf of those suffering from venereal disease. The other aim sought by placing these diseases on the reportable list was direct protection of the public health by furnishing to our boards of health, institutions, and physicians, additional facilities for the detection and cure of these maladies and, in such cases as it became neces-

sary, the authority to exercise direct quarantine control.

Because of the peculiar nature of venereal diseases it was felt wise, as an initial procedure at least, to have reports made direct to the State department of Health rather than to the local boards of health. This procedure seems to have worked well in practice; for a gratifyingly large number of cases have been reported by the medical profession; although far below our best estimates of the actual number of active infectious cases existing. From February 1, 1918, to May 1, 1919, 10,778 cases of gonorrhea and 4841 cases of syphilis have been reported to the State Department of Health.

The primary object in reversing the usual procedure followed in the reporting of diseases dangerous to the public health, that is, having the reports made anonymously, by serial number, direct to the State Department of Health instead of by name first to the local board of health and by them to the State Department of Health, was to respect the natural desire of patients to have their identity kept secret. But inasmuch as the public interest demands that the ignorant, careless, or vicious venereally-infected person be made to recognize that he or she must conduct himself in such a manner as not to endanger the health of others, the physician is directed to report all such incorrigible cases by name to the

State Department of Health. Thereupon this Department reports all the circumstances, except the name of the reporting physician, to the local board or boards of health within whose jurisdiction such a venereal disease carrier is presumably to be found, and assists the local authorities in actually locating the individual if possible. It is not yet clear, perhaps, to all physicians that the actual police power to restrain and detain such individuals while they are actively infectious is vested by statute in the city and town boards and departments of health and not in the State Department of Health. After such venereal carriers are located they are required to attend faithfully for treatment either at State-approved venereal clinics or go to some physician selected by the offending patient who is also acceptable to the board of health and who keeps the local health authorities informed of the progress of the case.

In actual practice a large and, I feel, a constantly increasing proportion of such cases, called "reclaimed" cases, are being treated systematically and thoroughly at the clinics. This feature of our program next to the successful manufacture of arsphenamine (salvarsan) has been the most satisfactory in its actual operation.

Even making full allowance for the hundreds of physicians who are undoubtedly defying the law by refusing to report cases of gonorrhea and syphilis, the coöperation of the general medical profession has been splendid.

In the fourteen months during which the reporting system has been actually in operation the profession has reported *seventeen hundred names* as "lapsed" cases. With this information at hand our epidemiologist for venereal diseases has succeeded in bringing eight hundred and fifty of these cases back under regular medical treatment and supervision, largely by the venereal dispensaries.

When we pause to consider that in this group are a very large per cent. who, if left to their own devices, would be most active spreaders of infection, the preventive value of this phase of the work can hardly be overstated. We cannot be certain just what proportion of the total actively infectious venereal cases existing in the state during the past year our 15,619 reported cases represent, but based on the proportions of the results of the examinations of the first two million draftees it must represent a very respect-

table percentage of the actual number of cases existing.

The State Department of Health opens and keeps a ledger account with each registered physician in the Commonwealth of the serial numbered blanks sent to him and they are systematically checked off and credited as the reports come in. In this way a long overdue account is beginning to accumulate against some physicians. Many, of course, are retired or are specializing in lines where they never see venereal cases. But after these are eliminated there remains a group of physicians who will have increasing difficulty in convincing the health and judicial authorities of the state that they have complied with the law's requirement.

The primary basis of the State Health Department's program for venereal disease treatment is that these diseases beyond all others, save perhaps malaria, are most effectively prevented by concentrating intensively upon the already infected individual by therapeutic measures. Important corollaries are (1) the need of rendering therapeutic agents and therapeutic skill as widely available as possible to everyone in need thereof at a minimum cost; (2) recognition of the fact that by and large the medical profession cannot furnish this therapeutic service as effectively as can specialized medical experts; (3) the need of respecting the patient's desire to avoid publicity; (4) the public health obligation of properly instructing the victim of venereal disease as to the serious nature of his trouble, and the measures of precaution necessary to insure against infection of others. All of these requirements the venereal disease clinic fulfills to a greater degree than any other agency,—hence the settled policy of the State Department of Health to develop the possibilities of the clinic to the utmost and our strong desire to receive the hearty coöperation of the medical profession in general in this movement. These clinics can be utilized to a very high degree by the medical profession as a means of assisting them in diagnosis, not only by utilizing the laboratory aids the clinics can furnish them, but also by giving the opportunity to "brush up" on differential diagnosis by actually attending the clinics, and as a source from which they can secure supplies of arsphenamine for their own use, free of all cost to them and their patients. In all, twenty clinics are in operation or planned for early establishment in twenty cen-

ters of population. When all are properly developed they will place within easy reach of at least 90% of our population expert facilities for the treatment of venereal diseases. They also serve as twenty distributing centers for the state manufactured arsphenamine. The clinics are under the direct control of men who have either long been qualified as specialists, or, in the case of some of the clinics in smaller cities, of men who have taken, and are still taking, special work in the genito-urinary, gynecologic, and syphilis clinics of Boston to better fit them for this specialized work. For the purpose of standardizing our clinic procedures and building up a spirit of team work among the medical staffs of these clinics, Dr. Hugh Cabot of the Massachusetts General Hospital staff has recently consented to serve on a part-time basis as clinical supervisor of the state-approved venereal dispensaries.

In general these clinics must be either maintained directly by the board of health, or if maintained as a part of the out-patient service of a general hospital, receive the written endorsement of the local health authorities. They must also agree (1) to serve as distributing centers for arsphenamine for the territory assigned to them, (2) keep certain standardized records, (3) maintain an "adequate" medical clinical laboratory or follow-up service, and (4) feature educational or preventive measures. Thereupon each such clinic receives \$1000 annually from the State. Of course, the other expenses which must be borne by the municipality or hospital, or jointly, are in all cases much greater than \$1000.

It is by no means desired to have these clinics absolutely free. The State Health Department's policy is rather to advertise them as free and to keep them on an absolutely free basis for those whose means do not permit payment. But those who can afford to pay reasonably small fees, the Department considers should be encouraged to do so, both for the purpose of rendering the clinics partially self-supporting, and as a means of retaining the clientele's self-respect. Properly developed follow-up service will soon enable the medical staff of the clinic to differentiate between those who should and those who cannot pay even small fees.

Another important function of the venereal clinic is to cooperate with the courts. This does not mean in any case that these clinics are to be utilized as means of police detection for offend-

ers against chastity. But our judges are beginning to appreciate more and more each month that a well-organized venereal clinic can be of great assistance to them in the proper disposition of their routine cases.

This briefly states the case for the venereal disease clinic. It is worthy of note that the great majority of them are affiliated with hospitals, usually as one of several out-patient clinics, but in some cases they are being conducted, and thus far very successfully, by boards of health in rooms in the center of the city without direct hospital affiliation.

As to the extent of the actual need for hospital beds for acute venereal cases, my personal opinion and that of the executive staff of the State Health Department becomes more conservative as times goes on. The need for adequate dormitory care for convalescent ambulatory female gonorrhoeal carriers is a real one and is a field that is still far from properly developed. But just how far actual general hospital beds are needed beyond those now available is, I believe, a question that cannot be answered dogmatically at the present time. It is a field in which active coöperative study by venereal disease workers and general hospital administrators is clearly needed.

One thing is certain. A very marked change in the attitude of general hospital administrators is observed when the present is compared with the situation only two years ago. Three distinct methods of meeting the question are being utilized: (1) setting aside of definite wards restricted to these cases and treatment of patients infected with venereal diseases. This plan involves considerable extra maintenance charge but has many commendable features. The Massachusetts Homeopathic Hospital and the Worcester City Hospital have followed this plan, each providing twenty beds for female patients; (2) another system is to keep available a limited but elastic number of beds for venereal cases in conjunction with the general wards; in some instances there are still further restrictions in this plan. For example, the Massachusetts General Hospital assigns beds only as they are called upon for them by their own out-patient department. Peter Bent Brigham Hospital is limited both in numbers and to Suffolk County residents; (3) the third policy is followed by certain institutions which, as a rule, are available only for distinct social groups.

In this group the institution has no limit as to cases accepted, provided only that they are eligible to treatment in the institution. The The State Infirmary at Tewksbury, the New Bedford City Hospital, and the United States Marine Hospital at Chelsea are examples of this group.

Thinking such a statement might be of interest to the members of this section I have incorporated in this paper a statement of the hospital beds available for venereal cases at the present time in the State.

With regard to facilities for hospitalization, there are now available in the State at Tewksbury any number of beds required.

Massachusetts General Hospital, sufficient to meet the needs of the Out-patient Department.

Massachusetts Homeopathic Hospital, 20 beds for women, regular hospital rates.

Peter Bent Brigham Hospital, limited number, Suffolk County cases.

New England Hospital for Women and Children, 3 beds at full ward rates.

Boston has, in addition to Long Island Hospital, any number of beds required. Boston City Hospital, sufficient for urgent cases. New England Baptist Hospital will accept acute cases of venereal diseases. Talitha Cumi Maternity Home and Hospital, Jamaica Plain, takes gonorrhea cases. United States Marine Hospital takes venereal disease cases.

Fall River admits as many as necessary from clinics.

Worcester City Hospital will soon be able to accommodate twenty.

Lynn Hospital admits a few cases.

Bridgewater State Hospital, State Farm, takes venereal disease cases.

City Hospital, Fall River, takes venereal disease cases.

Franklin County Hospital, Greenfield, will accept acute cases of venereal disease.

Holyoke City Hospital, Holyoke, will accept cases of venereal disease.

Nantucket Cottage Hospital, Nantucket, will accept cases of venereal disease.

Almshouse Hospital, New Bedford, has separate building for venereal disease cases.

Chelmsford Street Hospital, Lowell, Charity Department, takes venereal disease cases.

Newton Hospital, Newton, will accept acute cases of venereal disease.

City Hospital Almshouse, Springfield, accepts venereal disease cases, free treatment.

House of Mercy Hospital, Pittsfield, accepts patients from the venereal clinic.

#### DISCUSSION.

DR. C. MORTON SMITH, BOSTON: Dr. Kelley has given an excellent outline of the State Department of Health's program for combating syphilis and gonorrhea. I wish to speak chiefly from experience in the syphilis department of the Massachusetts General Hospital. In the two months immediately following the first of March, 1918, when syphilis was made reportable, there was a distinct falling off of attendance at the clinic, particularly in old patients with late manifestations. They felt they came under the ruling and were to be reported to the State Departments of Health and in some way their movements would be controlled. After two months conditions became normal.

Our instructions, which from the first were to report only *infectious* individuals, have been carried out both in private and hospital practice. As far as statistics are concerned, this is very misleading, for from the period from March 1, 1918, we have reported 340 cases of infectious syphilis. There have been admitted to the department during that same period 1418 individuals, and 1000 patients were transferred from other departments or referred for consultation or treatment, so the infectious individuals bear a very small proportion to the total number of syphilis under treatment. Of the reported cases in 24 or 25 only has it been necessary to report the individual to the State Department of Health by name; and of these, only 18 at the present time remain, as Dr. Kelley names them, "unreclaimed." The others have been brought back to the clinic by one means or another.

I appreciate that the use of the term "venereal disease" by the State Department of Health is simply following the example set by the U. S. Public Health Commission and by the Army and Navy. The use of the term "venereal disease" by the Army and Navy seems a perfectly proper one. I have no quarrel to make with that although I have seen several cases of men discharged from the service whose infection was of non-venereal origin. For many years we had been working to divorce syphilis from the straight venereal diseases. When the fact is recognized that at least ten per cent. of all cases



of syphilis are of extragenital, non-venereal origin, it seems perfectly fair to assume this position, and the experience of the last few months would indicate that ten per cent. is too low rather than too high; this does not include the cases of marital syphilis or congenital syphilis. When these groups are added, it brings the number of absolutely innocent victims well up toward the fifty per cent. line. Of the cases I have reported in private practice, I think that a trifle less than 33 1/3% have been of extragenital infection. Some of these cases were unusually troublesome where syphilis was recognized, but the point of infection not determined or suspected. They have included primary infection of lip, tonsils, tongue, anus and abdominal wall—the lips and tonsils leading in frequency.

The State clinics should take, as Dr. Kelley states, a prominent position as teaching centers for the dissemination not only of arsphenamine but also of the knowledge of the disease, because syphilis is such an adept imitator there is hardly a skin lesion that it may not simulate. We have had quite a number of cases of pityriasis rosea sent to the clinic with the diagnosis of syphilis and a request to give arsphenamine. This resulted unfortunately for several individuals where the employer had been told the wrong diagnosis, which was promptly followed by a discharge from employment.

Certain of the benign infections other than pityriasis rosea are often confusing. There is among doctors as well as patients an optimistic tendency to consider a lesion of slight importance, calling it a chafe or boil, etc., without employing at that time a means of positive diagnosis, namely the dark field microscope. Bear in mind that practically a primary lesion of syphilis is never seen too early to apply this test successfully. The highest percentage of positive results is obtained in the early part of the primary stage of the disease, i.e., during the first four weeks. From this time on the likelihood of a positive dark field diminishes while the probability of a positive blood Wasserman steadily increases until the development of the second stage, when the serum shows a positive reaction in approximately 100%.

I cannot miss this opportunity for urging study of the natural history and general characteristics of the disease as well as its various manifestations. The laboratory methods have

supplemented but in no way supplanted the clinical observations; and please cultivate the habit of routine examinations but make the treatment individualistic. Take careful histories. Many feel that all syphilites are liars and that it is useless to try to take accurate histories, but in many cases a careful history is of distinct value. If a dark field is unavailable, satisfactory results can be obtained with Wright's blood stain on smears from primary lesions or mucous patches.

Consider syphilis as a chronic contagious disease rather than a venereal disease or a sex problem. The venereally infected are no worse off, and no injustice will be done the individual who is suffering through no fault of his own.

#### THE DUTY OF THE HOSPITAL TRUSTEE AND HIS RELATION TO THE STAFF.

BY MR. C. H. W. FOSTER, BOSTON.

*Trustee, Massachusetts General Hospital.*

PRESUMABLY the definition which we should put upon the word duty as used in the above title is that which indicates procedure,—proper or requisite procedure. What, then, is expected of me is that I should tell you what my experience as a trustee leads me to think is a desirable procedure in the organization and management of a hospital. But as the time allotted is short, it seems best to attempt only an outline sketch of such a hospital and in the sketch give prominence only to those points which may seem most likely to lead to discussion.

Assume the hospital is a charity hospital with a charter from the State and the usual corporation officers and a board of managing trustees. This board will have the ultimate and entire control over all the affairs of the institution, will make all appointments to the staff and to the administration, and in order to keep all its affairs in hand, all appointments, salaries, and other contractual matters will be made for the current year only. Of course, one of the first duties of the trustees of such a hospital will be to make such plans as will enable them, with the means in hand, to do the greatest good to the greatest number, medically speaking, that is, within the terms of their charter as a charitable institution. The interpretation of the word "charity" has occasioned many a discussion. Formerly the pauper only was concerned with it, but nowadays

a broader view prevails. A satisfying and, it is said, a legal definition of the word charity is: "A gift in trust for promoting the welfare of the community." Now a community is an assemblage of individuals, each of whom consists of clothes, a body, and, we will say, a soul. A hospital trustee is concerned with each of these. Every member of a community, rich or poor, should have access to the hospital equipment and organization, and it would be uncharitable to deny to them this necessary privilege; but the trustees may properly and, in fact, should, divide the community in the hospital plant, in accordance with their clothes, using this word to signify station in life. This should be done not only to conform to the whims of society, but because it is helpful to a patient's composure to be placed with those of his own standard of living and to have his surroundings and food correspond approximately to those to which he is accustomed. This means that in planning the hospital plant there will be a building for people of means with luxuries to which they are accustomed; a building equally comfortable but less luxurious and expensive for people of moderate means; and third, a building for the poor. The people of means will pay full price, the people of moderate means as much as they can, while the poor will pay little or nothing. Of course, any profit made in one branch of the institution will be used to pay a deficit made in another branch,—which in the case of a charitable institution has been ruled a proper proceeding by the Massachusetts Courts. Furthermore, this seems to be a wise interpretation, for not only does it provide additional funds for the needy but by treating all classes in the community with the same medical organization there is avoided the grading of the medical profession which might take place if the rich and poor had separately chartered hospitals. So much for the clothes,—now what will be the trustee's duty as to the body and soul of the community individual? He must see that the same professional treatment, the best that is in the doctors, is given to each and every patient alike, no matter what the clothes; and as to the soul, he must insist that sympathy, kindness, and tender care to all must be atmospheric in every part of the hospital.

Something now of the hospital organization: There will be three divisions:

1. *Professional*—having to do with the treatment and direct care of the patients.

2. *Administrative*—concerning the housing, feeding, and financial questions of the hospital.

3. *Educational*—and Scientific Department.

The Professional Division will have

The Medical Director,

The General Executive Committee,

The Resident Physician,

and the staff nurses, orderlies, etc.

*The Medical Director.* He should be a man of prominence in the profession. He will be appointed by the trustees and by virtue of his office will be chairman of the executive committee, but without a vote. He will be expected to concentrate all his professional activities at the hospital and may receive a salary. He will be the principal adviser of the trustees as to the medical policies of the hospital, will represent the hospital on important medical occasions, and meet medical men of prominence, and, in general, will concern himself with the medical progress and reputation of the hospital. He will take a paternal interest in the physical welfare of the hospital people and harmonize and inspire the professional work going on in the various departments. He will have no routine duties but will have authority to order the resident physician or administrator to suspend any person or action until the matter can be referred to the executive committee or trustees. In regard to the professional activities of the hospital, he will not only be considered as having every authority to investigate and interview, but he will be expected to do so—with the idea of cooperating as well as of becoming informed.

*Executive Committee.* It will consist of seven members, the two chiefs of the medical services, the two chiefs of the surgical services, two special department chiefs, and a junior medical or surgical man. The latter member will hold the office only during his months of service and the medical and surgical will rotate in filling the position. The medical director will act as chairman and the resident physician as secretary, without power of voting.

*Resident Physician.* He will have the immediate superintendence of the medical and surgical departments, except as to the direct treatment of patients, and the control of internes, externes, nurses, orderlies, and apothecaries. He will admit and assign patients to the hospital and will in general see that the rules of the trustees and the orders of the doctors are

to the treatment of patients are carried out. He will give his whole time to the hospital and will be paid.

*Administrator.* Before making mention of the staff, let us say a word in regard to the Administrative Department. The head of this department will be the administrator. He will be appointed by the trustees, upon nomination of their finance committee and treasurer, whose agent he will be in regard to all money matters and accounting at the hospitals. In general matters he will be accountable to the trustees, through their chairman or committee. He should be a man of business ability and experience. He will have charge of the plant and building operations, and the housing, feeding, purchase of supplies. He should create a budget of the income and expense at the hospitals, keep the various department heads informed concerning their part in it, and in general coöperate with and advise the hospital people as to proper financial transactions. All financial procedure at the hospital will be from the trustees through their finance committee to the treasurer, and thence to the administrator. Any difference of opinion or doubt regarding a money matter at the hospital will take a reverse course.

*Staff.* The trustees will generally ask the executive committee for nominations to the staff positions but will reserve to themselves the right to appoint any other candidate. There is an endless discussion as to the composition and duties of a staff, but let us accept this form. There will be two medical services, each with its chief, and two surgical, each with its chief. One medical and one surgical will be continuous services, the others will be so-called clinical services, in which each participating doctor will serve only a certain number of months per annum. The welfare of the community will find a distinct value in each type of service. The continuous service will provide the better opportunity for research work and the training of men therefor, while the clinical service will enable a larger number of men to get the hospital training necessary to a proper medical experience and time to engage in private practice. The introduction of a continuous service plan brings up instantly the question of a living for those who under this plan will give practically their whole professional time to the hospital. The clinical service men, with

their short hospital services, will still have time for a remunerative private practice, but how to provide for the continuous service men is the question. One plan is that the latter will be given the preference in the allotment of patients coming to the building for people of means and to the building for the great middle class—both of which classes will pay a professional fee. Furthermore, in some just way the hospital should regulate the fees and collect them for these full-time doctors and thus relieve them of the thought of a living and give them full time and thought for their professional research work. "There is plenty of evidence, at least here in this eastern part of the country, that there is being lost through two sources an ample living for all the continuous service and research men who might wish to work in the hospital. That is through the abuse of medical charity and through the fact that the hospitals have not provided accommodations for people of moderate means who would willingly pay a moderate professional fee. There is no question but what there are hundreds of would-be patients who are actually avoiding treatment and suffering thereby because they cannot afford the modern-day costs of specialists and expensive medical needs. These people must be treated in some such co-operative way as is possible in a hospital, and in that way save professional time and other costs. And in regard to the abuse of medical charity, there is the legitimate and the illegitimate charity: the former where the doctor gives up his fee to get for his patient the hospital treatment, and the latter where the patient pretends to be a pauper in order to get something for nothing.

A word or two as to the duty of the trustees in their appointments to the staff. Experience seems to show that in the long run it is good policy to fill vacancies on the staff by promotions, but not necessarily by seniority. But the prestige of the hospital will fall under this plan unless the greatest care is taken in the earliest appointments. The right sort of a reputation and the proper traditions will be maintained only if good judgment is shown in the selection of the young men and opportunity and encouragement are given to them to develop. It has been contended that this plan of promoting from within is liable to make a non-progressive and self-satisfied staff and that it

is stimulating to introduce new blood by an occasional appointment from without, and there are notable examples where this has been true, but much of this stimulation might be obtained by inviting celebrated medical men to visit, lecture, and operate; and perhaps even there might be some sort of an exchange professor idea as in vogue between colleges.

*Educational and Scientific Division* will include the various laboratories, x-ray, and special investigation work, autopsies, record rooms, medical libraries, and the relations of the hospital to medical schools and other medical institutions. There will be a committee of at least three from the men in the hospital most interested in this work, and this committee will study the welfare of the division and further its development. The chairman will be appointed by the trustees and with others in this division, if continuous service men, should receive in some way a living from the hospital. The medical director should either be a member *ex-officio* of this committee or at all events be in constant touch with its doings and the men concerned; for as the principal medical adviser of the trustees, he will find in this department the force which attracts the young men of greatest promise and through its discoveries, the making of a great reputation for the hospital.

A final word as to the personal relations between the trustees and the staff. On the part of the trustee let it be that of an intensely co-operative paternalism,—which will show firmness when needed but which will aid and encourage to an accomplishment the ambitions and efforts of the members of the staff. But it must be a just and considerate paternalism. It must recognize the fact that the doctors and hospital people are human, that they are, as a rule, overworked, and that as to money and recreation they are denied their fair share. Their compensation lies largely in the success of their work. The trustee must establish standards which will create respect and make effort worth while, then encourage all hands to forget themselves in the accomplishment—and we will have a real hospital both in name and spirit.

## THE RELATION OF THE MEDICAL STAFF TO THE TRUSTEES AND ITS DUTY TO THE HOSPITAL.

BY EDWARD H. NICHOLS, M.D., BOSTON.

THE duties of the medical staff and of the trustees are reciprocal, and not opposed. This fact is not always appreciated, for sometimes the two bodies appear to act at cross purposes. When staff and trustees do so act, it always implies lessened efficiency of the hospital. It should not be a question as to which body has the greater authority—it is a question as how best to divide authority to produce the best administration of the hospital for the benefit of the patient. Some of the duties are obviously divided. The trustees naturally should have entire charge of finances—partly because doctors, as a class, are notoriously poor business men. The “hotel” end of the hospital also should be entirely in the hands of the trustees—that again is a purely business proposition. The doctors must have entire control of the medical and surgical care of patients as that is purely a professional question, about which trustees, as a class, can have no intelligent understanding. When it comes to questions of hospital policy, for instance, what classes of patients should be treated, how cases are to be assigned to hospital services, the relations between friends of patients and the hospital, the question of free or paying patients, and many similar questions, the best of advice of both trustees and staff is needed to settle these matters wisely, and such questions should be settled only after conference of both bodies. Any assumption by either body that it possesses sole authority and wisdom, is likely to lead to a one-sided decision, dissatisfaction, friction, and inefficiency. While it may be said that legally trustees have the greater authority, it also is true that the medical staff is what makes a hospital first class, mediocre, or poor. A good board of trustees with a poor staff cannot make an efficient hospital. Yet a board of trustees composed entirely of medical men is very undesirable—on all hospital boards of trustees, the medical men should be in a distinct minority. Therefore, for an effective hospital, trustees and staff must coöperate.

What does the staff owe the trustees? Primarily, professional work done to the best of its ability. Members of a hospital staff are given unusual clinical opportunities which should make them more competent than the general run

of the profession which does not have those opportunities. One often hears of the "sacrifices" made by hospital doctors. It is true that the medical staff does sacrifice time and strength to perform its hospital duties—but the gain from exceptional opportunities outweighs, in the minds of most men, the sacrifices. It that were not true the desire for hospital staff appointments would not be so great. Hence, the staff having exceptional opportunity, owes exceptional duty. Occasionally individuals seem to forget this, and act as if the obligation were all on the side of the trustees. When a staff man reaches this very undesirable and erroneous frame of mind, it is time for the trustees to correct his judgment, or to allow him to retire to other fields of activity. He has ceased to be of value to the hospital.

The first one to be considered in a hospital is the sick patient. The trustees are responsible for the administration of the hospital—any lack in the care of the patients is a reflection upon the trustees. So the treatment of the hospital patients must be as careful, intelligent, and industrious as the care of private patients. The trustees should make it possible for the staff to give such treatment to many patients with the least possible effort, strain, or loss of time. If the trustees do not assist in this way, they are as remiss in their duties as is the staff man who performs his hospital duties in a perfunctory, careless and indifferent way. If a hospital can be so administered as to make it possible for the staff to have private hospital patients treated in the same hospital, it saves the staff's time, will almost certainly raise the standard of hospital treatment, and condenses the staff's interests; and this should be done when possible.

The staff owes the patients the same degree of judgment, sympathy, and consideration as would be shown private patients. If the staff treats hospital patients merely as routine work, with no consideration of the individual case and circumstances, it may obtain a clinical success, but an individual calamity. Hence, the staff must consider the circumstances of individual cases.

The staff owes the trustees economy. The trustees pay the bills, and must raise the money. It therefore is incumbent on the staff to request large expenditures only after mature consideration and deliberation, not to demand the purchase of every fleeting fashion in hospital equipment. On the other hand, lay trustees cannot

be expected to appreciate the value of many things in hospital equipment, which to the staff clearly are necessary. Hence, it is duty of the staff to educate the trustees along these lines. An equipment that was adequate about ten years ago would be quite insufficient today. The hospital has ceased to be merely a boarding house for sick people cared for by intelligent doctors—the physical equipment of a mediocre hospital is today expensive and elaborate.

In one particular the staff must of necessity be better informed than the trustees. The staff cannot help knowing better than the trustees the professional value of new additions to the staff. From an experience of many years in considering the appointment of new men to the staff of a large municipal hospital, I can truthfully say that never have I seen a man nominated by the staff for a junior staff appointment who was chosen except after most careful consideration, and after a conscientious attempt to select the man who would be best for the hospital. The trustees occasionally may be influenced by some glib or insinuating individual of the staff, or by some personal prejudice. If that happens, and the trustees attempt to interfere with the nomination of the staff, sooner or later the staff deteriorates. The only basis on which the trustees should interfere with the staff nominations should be on a question of character. The staff may not be infallible, but they bring to this question far more intelligent judgment than the trustees can. The staff must live with the appointees once they are elected, and in theory, should, and in fact, does exercise most careful judgment. It also should be made clear that an appointment to the staff is not a life appointment, but only during good and effective work—and the staff should be the first to request to be relieved of the presence of men who have outgrown their job or ceased to be interested.

The staff owes it to their special opportunities to add to professional knowledge, both by publishing the results of their special opportunities for clinical study, and by teaching either their professional brothers, or medical students. It sometimes happens that trustees cannot see the necessity and value of teaching, especially if the teaching costs the hospital money. It is true that the presence of students in any form is a nuisance in some ways, but their presence should be encouraged, nevertheless. Teaching invariably

bly raises the standard of clinical work in hospitals. There is no judge so critical as a class of half-trained medical students,—they compel a doctor to do his best. The medical information of any individual in such a class may be small, but the aggregate intelligence is astoundingly great. It may be possible to conceal ignorance before such a class once, but he who attempts to conceal ignorance often is sure to be detected. The teacher must be on his mettle: he is compelled to think clearly and to act intelligently. Hence, teaching is one of the very best possible means of maintaining a high grade of work by the staff. Good teaching is not easy—the trustees should offer every facility to staff teachers. A man who neither writes nor teaches cannot justify his continuing to retain his appointment.

The relation between the staff and patients or friends of patients is of necessity close and one of the most frequent causes of criticisms of hospitals. When friction arises it is, as a rule, the trustees who have to bear the brunt of the criticism; hence, it is the duty of the staff to use judgment, tact, and sympathy in dealing with patients and their friends. The trustees should not be expected to be the buffer in cases of complaint—the staff is much more likely to be considerate and careful if complaints about staff treatment and conduct are passed up to the individuals whose treatment or conduct is the cause of criticism, and if the offender is held accountable for his errors.

The duties of staff and trustees are in many lines closely related. Since this is so, it is essential that both bodies or selected representatives should often meet for discussion of matters in which they both are interested. In this way community of interest and mutual understanding are promoted, and intelligent action by both bodies is insured. This is one of the most important arrangements for intelligent administration of a hospital.

When an individual member of the staff finds it impossible to act in concert with his professional colleagues, it is clear that he has ceased to be of value to the hospital and either the disgruntled man or his colleagues should be removed. Nothing so rapidly leads to deterioration of the staff as an injured, disgruntled member of the staff.

The relation of the staff to the house officers is important. The staff cannot assume that the

house officer is a worm worthy of no consideration upon which everyone may tread. Large, modern hospitals depend upon the house officers for efficiency. The house officer must perform much arduous labor; in return he has a right to much consideration, and real interest and education from the staff. It is not enough simply to allow the house officer to bask in the light of the great man's presence; the house officer must be given an education in return for his always trying hard work.

#### DISCUSSION.

DR. H. B. HOWARD, Boston: Of the two papers the latter considers the organization as it has been for a generation at the Massachusetts General Hospital and at the Boston City Hospital. That is the organization that we here in Boston have been working under for a long time. I used to say that the hospital always considered first, the needs of the patient—the patient was uppermost; second, that it helped medical education; third, that it should advance medical and surgical science so far as possible. The old organization had some particularly strong points. It must have been pretty good to gather together and hold such a staff. You would have thought perhaps that the trustees existed first. I suppose that in both of these institutions the staff was the first thing that existed. They found out that in order to have a hospital, they must have a board of trustees—something to take care of the business end—men who understood finance, men who understood how money should be expended and had common sense in that direction. The first people you find to create such a thing were physicians and they were the organization before the hospital was built. Go into the history of the City Hospital—it was the same thing before that was taken up by the City Government. It was a foregone conclusion that they were the nucleus of the staff. This organization in both of these places has gone on all these years, one since 1820, very largely adopting the advice of the medical and surgical staff of that place. It has been very rarely that the advice of the medical and surgical staff has not been adopted. It has been avoided just often enough to let the staff know that the board of trustees had common sense, and that the advice of the staff must be well considered or it would not be adopted. I won't say that there was never a case when the staff was in the right and did not get what they wanted, but on the average when their advice has not been taken, it was when they were wrong. The members of the staff, I think, will agree to that. Old Doctor Hale used to say that the greatest word in the English language was

"together." There is a board of trustees; there is the executive; there is the medical and surgical staff. The great thing is to get those three separate organizations, all of which have good, normal, healthy functions, to work together. I do not mean by that that one should not frankly criticize the other. Frank criticism by the one or the other is what brings progress; but this old organization of the City and the Massachusetts General does not need to be radically rooted up and thrown out of the window. It needs to be studied, strengthened, amended, and have a legitimate growth so that it shall gradually grow stronger. This medical director man at the top, whom Mr. Foster explained as he read his paper, I wondered where he could get such a man and if we were sick of him or he could not do his job, well, where would he go? Because he would feel that his calling was gone. Or, if we lost him, where would we get another? If you put a man on that apex and he does not fill your bill, what is he going to do when you get through with him? He cannot practice medicine, his practice is gone. Where are you going to get another? It is not a profession yet. Now, some hospitals have such a man without his ever being appointed. Johns Hopkins Hospital has had such a man who has practically assumed that place from the beginning. He is a wise, careful man, and what he has thought out and talked over with the various staffs, the executives, and the board of trustees, is the thing that has been always carried through. He has never drawn a salary from that position. Gradually he has advised that institution, and his advice has been taken for other large places. The Massachusetts General Hospital and the City Hospital may develop such a man, but you cannot go and find him and put him there without driving out men that never ought to be driven out.

There are some things that have not been worked out well at either of these places. This afternoon there is not time to bring up all these points, but there are some things that have not been worked out well. I will be frank about it. There are splendid ideas in the younger men of the staff all along the line, but they rarely get up for proper consideration out of respect to their chief. They never can get up without their chief. There ought to be some legitimate way by which bright ideas lower down the line could get up for discussion. I have seen them in my 25 years of experience in general hospitals smothered many a time—ideas that I would like to have been father of—ideas that I would like to have been the first to have thought of. I say that along that line there could be considerable work done so that those things should come up legitimately. Perhaps it is because I have worked so long under that old organization that I still think the trustees, the executive, the staff, is a pretty good form of

organization, and it needs to be studied before it is changed very much. No man can be on that apex job without duties and be worth much for any number of years. He will soon lose his ability to give advice and to know what advice of others should be taken. A man has got to be a doer in order to be the proper one to advise the rest of the staff and the trustees. He has got to be in close touch with the way things are done. I know there are lots of good men in Boston, but I do not believe it is possible to find a man in Boston to put on this apex job at the City Hospital or the Massachusetts General Hospital or the Brigham Hospital who will have any sort of reputation with staff, trustees, or anybody else at the end of two years, if he is any good. He would lose his reputation if he were any good. He would have to be a man who was steadily catering to somebody in order to hold on to his position. Apparently one of his duties is to meet big men. Now, big men, when they come to the hospital, do not give a snap for anything like that. What they want to see is what the hospital is doing, how the medical and surgical work is carried on, how the patients are cared for—that is what they are wanting to see. I have never felt so much pride in anything I have done as when a man has come back the second or third time to look over what we were doing, after he had gone away and made his notes and had not got things quite clear, and came back to get them straight. Just before this war broke out I nearly lost my head temporarily because an old German inspector of hospitals came to look over a hospital which I had much to do in building and came back for the third time to study the plans of the typical ward. It was the greatest compliment that had ever been paid to me; he did not come to see me, but to see what had been done. Now, any man that has got to the prominence of occupying this apex position I don't believe will ever have time to do anything so that people will want to come back and look at it.

I have in my pocket a little pamphlet which was written by a man who gave me a great deal of advice and spent lots of hours to help me—George H. M. Rowe. He wrote and delivered this on October 14, 1902, in Philadelphia: "Observations on Hospital Organization," paper by George H. M. Rowe, M.D., superintendent of the Boston City Hospital; presented at the fourth annual meeting of the National Association of Hospital Superintendents, in Philadelphia." I want to read one sentence from it, "Yet, after all that has been said, when you come to the vital point of hospital organization and management, whether the executive be strong or weak, whether the staff is distinguished or mediocre, whether the funds are ample or barely sufficient to produce results, the ranking of a hospital depends on the character and ef

iciency and determination of the managing board more than on any one thing." He goes on to say that you need a strong medical and surgical staff also; in fact, takes up pretty carefully the whole relation between trustees, executive, and staff. All of us who knew Rowe knew that he believed in frank talk, and when you left his office you knew what was in his mind. You never left with the idea that he covered up anything from you. He was not always pleasing, but he was frank. He did not spend all his time in being affable to us, but no one ever questioned the old man's integrity. If any one of you is studying hospital management and organization, it is worth your time to read that little pamphlet.

We can't condemn, and should not condemn, offhand, Mr. Foster's organization. All organizations ought to be tried, perhaps, but an organization that has got together a staff like that of the Massachusetts General Hospital and has held it towards a hundred years is worth study as it stands. I won't say it can't be strengthened. Nothing is so good that it can't be improved, but it should be a long time before we should interfere radically with that organization.

MR. C. H. FOSTER, Boston: I agree thoroughly with everything that Dr. Howard has stated. I think that my use of the words, "medical director," has brought out exactly the thought in his mind that I had in mine. That there is great need of some concentration of the activities, professional activities in the hospital, in some one person who is available and is known to everybody as being the one you should consult in regard to the professional matters. I used the term "medical director"; we can use any other term. I think, perhaps, you would agree with me that if such a person were to be hunted for, we all of us could think of some one man immediately who would be glad to try such a business. I would not hesitate a moment to see Dr. Howard try such a position. I do not agree with him that there are no men able to do that sort of work. He should be a man who has reached the eminence of his work and perhaps is about to retire.

I think that perhaps what Dr. Howard has said in regard to giving the young men a chance is one of the truest things he has said; and I think if there is any way we could introduce such a man as is outlined in my title, "medical director," who could be of value to all concerned, he would be of great value to the hospital.

The organization of the Massachusetts General Hospital would not be changed at all by such a position being originated. In fact, it exists now, except that we have not expected of the chairman of the executive committee the various duties and thoughts which I have expressed. That is all.

DR. HENRY A. CHRISTIAN, Boston: This

question of hospital organization is one of the greatest importance to the welfare of our hospitals that can be brought up. Organization on paper is not worth much. The only value in organization is in so far as it is able to procure the best men for the job and give those best men the best opportunity in their work. Mr. Foster has described a purely local organization, good, no doubt, for that institution, probably inapplicable to most other institutions because most other institutions are different—have different problems, have different purposes, work differently, and have a different personnel.

The keynote that would be expected from the titles of the two papers would be the relationship between trustees and staff. Almost nothing has been said by either speaker on this topic. Why? Largely because there are no relationships between trustees and staff. I do not mean that there are no opportunities for formal proposals from the one to the other, but no chances for mutual discussion. At present there is very little opportunity for the staff to learn the workings of the minds of the trustees and to gain for their work the very excellent suggestions that necessarily would come from contact with that body, and vice versa. There is just the opposite lack in the other direction. Now if we are going to accomplish a great deal, it is going to be by co-operation. That has been referred to, but how are we going to have co-operation if we do not have a great deal of opportunity for contact?

I have been interested greatly in this question of hospital organization. In one way or another I have worked in Boston hospitals rather differently from most members of the staff of these hospitals because, except for the period I was at the Carney Hospital, I spent all day of every working day in the hospital in which I was working, and I worked in these hospitals in various capacities:—two years at the City Hospital as pathologist; two years at the Massachusetts General Hospital as a ward teacher; five years at the Carney Hospital as visiting physician; and six years at the Peter Bent Brigham Hospital as physician in chief. This should have brought me in contact with trustees. In these various capacities at various periods in my life actually I have had very little contact with any hospital trustee, and most of them I have just known by sight. At present I but rarely see the trustees of my hospital.

It seems to me what we need is an opportunity for the staff and trustees to meet and to discuss questions, not necessarily because the staff is going to teach the trustees a great deal, not because the trustees are going to teach the staff a great deal, but because by mutual discussion the institution is going to profit greatly and a greater co-operation and a greater possibility of advance is going to come. I do not believe we



are going to have that relationship in any form of organization until that time comes when members of the staff, chosen by the staff, sit regularly at some of the meetings of the trustees and share in their discussions, and in the same way members of the board of trustees sit regularly at some of the meetings of the staff or its executive committee. That has not been done in any institution with which I am familiar. It seems to me it would be a forward step. I do not mean to make a member of one body a member of the other. I do not mean to have them present at all meetings, because naturally questions come up that can be discussed better in the absence of a representative of the other body. Members of hospital staffs at present have very little opportunity to know their trustees and to get them interested in the work of the hospital and to get them really to know the institution; and, most important of all, to have them actually advise as to good methods—better methods of accomplishing the work. I would make that suggestion as a possibility of improvement and an advance in the present relationships.

DR. P. E. TRUESDALE, Fall River: About a month ago I attended a meeting at Hyannis, the purpose of which was to encourage a proposition by the local medical men to build a small hospital. In this small community physicians were doing precisely what had been done in Boston more than a century ago by Dr. Holyoke, Dr. John C. Warren, and Dr. James Jackson, when they advocated the construction of the Massachusetts General Hospital,—medical men thus proposing to meet the hospital needs of the community. The repetition of similar movements since have been innumerable, and yet today it is unusual to find medical men on the boards of trustees of large hospitals. Surely medical men with special training are familiar not only with hospital planning but hospital management as well. Lawyers plan court-houses; manufacturers plan and operate their mills. Why should not physicians share the greater responsibilities of hospital trusteeship? On occasion it appears to be a policy among trustees to eliminate the physician in hospital affairs that are not purely clinical.

Dr. Howard has observed that not infrequently bright ideas come from young men, and without doubt he, himself, has utilized them with discrimination, but as a general rule the ideas of the younger staff members seldom become known to their hospital trustees. Would it operate disadvantageously if hospital trustees were to add one or more physicians to their number? Would it not serve as a line of communication between the responsible heads and those who are in immediate contact with the sick, those who are engaged in working for the welfare of the sick?

Coming from another part of the State, I

cannot speak from the standpoint of an individual who has intimate contact with large hospitals, but we all know that one of the most progressive and productive hospitals in the United States today, St. Mary's, of Rochester, Minnesota, was planned by doctors, and its policies are directed by members of the profession. What is done in Boston in hospital affairs lends considerable influence over a very wide range of the country. We look to you for advanced methods of organization and direction in order to improve our hospitals and to do what we can to elevate the standards of medical and nursing service in caring for the sick. When we are informed here that in your large hospitals there is little or no communication between trustees and hospital staffs we are not amazed to learn that there are disadvantages thus incurred and all does not work well under such arrangement. May we not look forward to a solution of this difficulty as well as many others in order to keep the standards of hospital service on a high plane?

DR. THOMAS ORDWAY, Albany, N. Y.: I had not intended to say anything this afternoon, but I want to point out one of two difficulties about the representation of the staff on the board of trustees. If there is going to be any representation, it seems to me that it should be adequate, for a single medical representative on the staff might, by talking in technical terms on certain medical subjects, express opinions which would be very misleading to the board of trustees. On the other hand, when two members of the staff are on the board of trustees, these two members may have opposing opinions and express these opinions rather emphatically; this may lead the board of trustees to think that the staff cannot agree and then they are apt to disregard the opinions of both. Therefore I would suggest that, instead of the representation of one, or even of two members of the staff on the board of trustees, the entire medical board of the hospital (which should be small—six or seven) meet regularly with the executive committee of the board of trustees, as these two bodies are, or should be, representative of the staff and administration on the one hand and the board of trustees on the other.

The other point under discussion about opinions and suggestions of the younger members of the staff reaching the board of trustees: It seems to me that when the medical board of the staff is formed properly, a member acts as representative of each major department of the hospital organization on that board and, therefore, it is his duty to have free discussion with all members of his own department and present their suggestions to the medical board at the joint meeting of the latter with the executive committee of the board of trustees.

MR. C. H. W. FOSTER, Boston: There has

been constant reference to having a medical man on the board of trustees. The Massachusetts General Hospital has had one ever since I can remember and has one today. Dr. Walcott was on the board for a great many years, and Dr. Tuttle has just been elected to fill Dr. Walcott's place on the board. And the committee of the Massachusetts General Hospital meets with the executive staff once a month. I just want to correct the wrong impression which seems to be going around.

DR. H. B. HOWARD, Boston: I want to call attention to one thing—a medical man on the board of trustees has proved a great drawback and has proved a success. Now a medical man on the board of trustees of the Massachusetts General Hospital has not been at the same time a member of the staff. It is very important if there is a medical man on the board of trustees, that he should not also be on the staff. Where a man has been a member of the staff and a member of the board of trustees, I have never seen that arrangement work well. I won't say it never will, but I have never seen it work well. The other members of the staff are jealous of him right off, and generally he is a little unfair. He always has the reputation of being so.

DR. HENRY A. CHRISTIAN, Boston: I would like to correct the mistake I made about there being no meetings of the members of the staff with the members of the board of trustees of the Massachusetts General Hospital. Mr. Foster has said that such meetings regularly occur at the Massachusetts General Hospital; but he informs me that they have just started these meetings and they have been in effect only a short time, and hence my error in not knowing about them.

## RECONSTRUCTION HOSPITALS, MILITARY AND CIVIL.

By FREDERIC J. COTTON, M.D., BOSTON.

A RECONSTRUCTION hospital is one designed and run to produce end-results,—focussed, not on anatomical but on functional cure.

Its aim is curative and only incidentally, if at all, vocational, though work is one of the methods of cure.

Its aim is economic, but its work curative only.

It aims not only to do medicine and surgery but to cover that no-man's land between the time that a man is technically cured and the time he begins to be good for something.

Reconstruction means *doing* the work of cure instead of half doing it or only starting it.

The reconstruction movement, like the movement for hospital efficiency, Codman's drive for the end-result system, the standardization movement of the A.C.S., means that we need better work, completer work, than we have been doing in our hospitals, and it means that the special problem of the wounded—the potential cripples of the war—has jarred us into action.

A few have long known that only by shifting our point of view to the *results* end, and co-ordinating surgical and allied staffs to reach that end, and co-ordinating them under leaders really interested in that end, can real results be achieved.

Now the war work has brought a test, and proved openly what the few have known.

Now everybody knows it, and we are calling the work reconstruction, and the time is ripe for application of the lessons of the war to civil life.

That the war hospitals in this country should show, as they have shown, results in the way of functional restoration beyond all experience of us old hands in civil hospitals, is a marvel.

That it should have been accomplished under the tremendous handicap of military-medical management, with its over-centralized control, under the uncertain tenure of all sorts of ever-changing officers, under the assaults of self-interested and faddist folk of many kinds, from water-curers to Freudian and other psychologists,—that this could have been so done as to show the results actually accomplished, only further proves that the central idea was right.

Let us not make the mistake of considering the work done in the war a military matter only, or a result of discoveries or experience.

Save for the Carrel-Dakin treatment the discoveries have been almost negligible. Save for the vast need and the vast resources in money and men to meet the need, the war has nothing to do with it.

The sole advantage has been that the hospital problem to be met has been one of wounds in healthy men,—a limited problem of large possibilities, and that the great need and the great resources have made conditions fluid to meet this problem and to organize for results.

New institutions had to be reared—and could be—free from hampering traditions, and in a couple of years it has been possible to go farther than in a decade of peace.

But the principles are not a war matter, nor new at all.

Indeed it is curious to note how little the plans first laid out have needed change up to today.

Two years ago Dr. Brackett and I came before the council of the Massachusetts Medical Society with a reconstruction program which we, with Dr. Goldthwait, had worked out, based on our knowledge of the problem and of the excellent work that had been done by French, British, and Canadians, to cope with the problem as it has come to them.

This was the first public appearance of the "reconstruction" idea in America.

This was the program now being carried out in the hospital of which I have had the honor to be chief of staff until a few days ago,—U.S. Army General Hospital No. 10, on Parker Hill, Boston, and in two score other centres.

This is the plan I want to see put into civil practice here and elsewhere.

This is the plan that I want to see put to the reclaiming of our great army of cripples and part cripples in the community, whether they have fought in France or got their hurt in a factory or on the street.

And I expect to see it.

What is this plan?

First let us see what has been done and is being done.

For the moment let us go by the acute immediate surgery,—admirably done in France, not badly done here.

Let us take the man with a shattered thigh,—past the first operation, past great chances of death, but infected, ill, facing the chance of life-long disability. Long before he comes back home he has had every care taken by wise splinting and other detailed care to avoid preventable deformity,—and by disinfection and dressings to lessen infection.

He gets home here to a fixed hospital—to stay till cured.

Here he comes into an institution in which the chief-surgeon is responsible. Under the chief is the sub-chief of the septic division, who becomes personally responsible and he obtains promptly:

1. The history.
2. The examination.
3. The x-ray.
4. A culture.

The sub-chief is not an assistant but an experienced surgeon.

An operation is necessary: the sub-chief does it in his own operating room. Carrel-Dakin treatment is instituted,—he does the dressings or oversees them,—the solutions are made daily by an expert pharmacist under the chief's supervision. The nurses tend to the installations, *regularly*—that is their job and they wouldn't last a day if that didn't take precedence over ward-bed making, in case of conflict of the two.

One of the assistants with us is a real orthopedist—responsible for the many bits of apparatus needed in these cases—responsible for getting them from the shop and fitting them to do their appointed service.

Presently the time comes for physio-therapy, massage, and for the occupational bedside work that has proved so useful.

Prescriptions are written for this work, and it is done under the surgeon's eye even though by members of other departments. Later, the man is ready to go to the physio-therapy rooms,—perhaps to limber his knee—but he goes on prescription, on daily visits, and is not transferred from the ward.

That is the point,—from the day he comes in till he is healed and solid, and well—he is under the jurisdiction of one man who is responsible for him, under one ward surgeon charged with his detailed care.

He is not shuffled off into an out-patient department and lost.

Suppose it is a nerve case, the patient is assigned to a nerve ward and comes under the neurologist or neuro-surgeon, as may be.

In our clinic it has been the neurologist who overhauls the case and dictates the treatment or calls in the surgeon.

Given an operation, the surgeon does it and sees the patient through the first period, at which time he is already on a splint, previously prepared through the orthopedic surgeon in the shops.

From this point the neurologist is the man in charge, following out his tests, dictating to the physio-therapy aide the bedside massage and electrical treatment and later the exercise work,—dictating the occupational work indicated later on in the game. Here again until far along in convalescence the patient is under *one* head.

In amputation eases the head of the amputation clinic in charge of operating work, of fitting the limb, and orders the massage and baths, the stump-drill, and the exercises.

So with the other cases, classified or not,—one man is in charge throughout and the principle I have harped on for years—the principle of continuous personal responsibility—is finally, for once, really effective,—and I am willing to stand by the comparison of results.

The hospital of this sort is necessarily going to have a competent staff but no larger outfit than one often meets, though better trained and equipped than is usual.

The thing that is different is that one man, or at worst one chief and one ward-surgeon, take the responsibility for the patient and this crew sees him through.

All the work done for him by many people—skilled each in his or her branch—at all stages from entry to cure—is done under the authority, on the prescription, with the interest of one man.

This man is not trying to do the most operations to unload on the out-patient department so he can write about them.—he is concerned in getting John Smith well,—ready for discharge, ready to take up life or retraining as may be, as good as he can be made.

Notable work has been done in detail.

The handling of septic bone-wounds has been marvellously successful.—amputations have been admirably handled and outfitted, wonderfully good crews of physio-therapy workers have been gathered and trained, expert in bath, electrical massage and exercise treatment, and admirable work done in occupational therapy, not only at the bedside but at the bench, work of great value in physical cure as well as in restoring morale.

But, fine as all the departments have been, one must remember that the best part of it all is that they have been doing *team-work* with one definite object—the object of cure—the object of producing a really complete specimen of John Smith, reconstructed as far as can be done, and ready for use again.

And that is why so large a majority of our boys are made 100% fit for what they want to do.

I am not going to weary you with detail or statistics if you want to see you will be welcome at No. 10. All you need do is climb the hill and you can get all the detail.

What I want to do today is to ask you how we can secure for our civil work the advantages of a war hospital and get something like the war results, as we have *not* done in the past in civil life.

It is possible to teach old dogs some tricks, but old institutions, never, and I believe our problem is to erect new institutions or better yet, take over those now doing army work in reconstruction—to take advantage of special equipment if we can, of specially trained workers at least, particularly the wonderful women-aides, and to follow out the military plan as it lies for non-military work, till we learn how best to modify it.

It has been too good to change till we know why and how.

In many communities this matter is going to be difficult: because hospitals must revert to title holders, and staffs inevitably scatter.

For this district the Elks Hospital was built for no other purpose than reconstruction and is probably available, though details are not yet worked out.

Moreover, with a premonition of this problem, No. 10 has largely been staffed by Massachusetts doctors, nurses and aides,—they are available.

Let us hope that Massachusetts may lead again, and that this may be the birthplace of civilian as well as military work in effective reconstruction,—work for the cure of the disabled.

A few years ago a well-known, rather ultra-scientific head of one of our institutions told a young applicant that what he really wanted was not a chance in the institution in question but a job as house officer in the ——— or ——— hospitals,—“one of the repair-shops.”

In this community we are not likely to lack for alleged scientific work,—what we need most is the human “repair-shop.”

We have learned repair work under the stress of war—let us see that peace shall also have its repair-shops and have them run at near 100% efficiency.

#### CASE RECORDS AND HISTORIES IN THE SMALLER HOSPITALS.

By HORACE P. STEVENS, M.D., CAMBRIDGE.

THE value and need of an adequate system of case records for every modern hospital is so well recognized and generally appreciated that

it hardly seems necessary for me to dwell upon it here.

Apart from their importance in cases of tort, as a means of protection in suits for alleged malpractice, and in all other medico-legal controversies, their paramount value is found in their direct service to the community. This community service is brought about in two ways.

First, through the study of methods and results as shown in the records, the hospital is able to give better and more efficient service, and, second, by giving convincing evidence of efficiency and an available measure of its service the hospital can seek and obtain more confidence, respect, and generous financial support and thus extend its scope and increase its ability to serve.

Another point of no small importance to hospitals which conduct training schools is the effect of good records upon the efficiency of the nursing. It is obvious that an institution having well kept records will, other things being equal, turn out better nurses, but further, since the laws for registration in many states require training in institutions fulfilling, among other obligations, proper standards of record keeping, such institutions will prove more desirable and will tend to attract a higher type of applicant.

In the larger hospitals great numbers of patients, frequent re-entries, complete laboratory facilities, and so forth, require, and larger house staffs and clerical forces permit, the keeping up of elaborate and complicated systems of records with multiple cross references and filing methods.

Such systems, however desirable, are beyond the reach of most small hospitals, because of lack of sufficient funds, insufficient number or absence of house officers, and small clerical staff; nor are they necessary, since everything is on a smaller scale and methods which would be cumbersome in the larger institutions are quite convenient here.

The problem for the small hospitals therefore reduces itself to:

What are the essentials of proper record keeping and how with the means at hand can these essentials be provided?

Now, just what are the essentials and why?

The Committee on Hospital Standardization of the American College of Surgeons in their

preliminary survey of hospital conditions ask the following questions and it seems to me that these cover points that any well equipped hospital can and ought to include in their records.

1. Are case records signed by the respective physicians or surgeons responsible for cases?

No hospital can hope to have good records without the active and hearty coöperation of its staff and nothing should be easier, or perhaps actually is, harder to obtain. A physician's or surgeon's signature should indicate that he indorses the record as accurate and correct and as it is distinctly to his advantage to have it so, he should demand the right to make such indorsement.

2. Do case records include:

Personal history of patient relevant to complaint?

Diagnosis on which treatment was based? (Preliminary or working diagnosis.)

Laboratory and physical findings?

Important points of operation or of treatment?

Post-operative (final) diagnosis? Complications of convalescence? Autopsy findings?

Comment seems hardly necessary on the above. It is obvious that any records worthy of the name should contain those points.

3. Do case records include follow-up records, and are patients told before leaving hospital that their subsequent medical history will be asked for?

The value of a suitable follow-up system needs no explanation. There is no room for argument. It is the only adequate way of checking up results, of recognizing and correcting mistakes, of discovering the causes of failures and of finding means of preventing their repetition. Furthermore, it helps to convince the patient of the sincere interest on the part of the physician in his welfare and thus foster their coöperation and mutual understanding. Any follow-up system can undoubtedly be more successfully carried out if the patient understands before leaving the hospital that future reports as to his condition will be asked for.

To all of the above should be added a workable card catalogue filing system. These catalogues commonly include

1. By patient's name.
2. By diagnosis.
3. By organ or region.

all having cross references, and to these are added, in some cases, all manner of subdivisions. The first of these, the catalogue by name, is essential in all cases in order to carry out any follow-up system and to keep track of re-entries. The second, by diagnosis, is very desirable as a means of looking up and compiling cases of a given type and in getting out an annual report. The third, by region or organ, and the various more elaborate subdivisions, while valuable, are by no means essential to the small hospital where the number of patients is comparatively small and searching through the catalogue for given material not an arduous task.

How, with the means at hand, are these essentials to be carried out?

I believe that every hospital, no matter how small, ought to be able to work out for itself a plan which would fulfill all these requirements. The difficulties are in some cases considerable, but by no means insurmountable, and the advantages of good records will amply repay the effort.

In order to get some idea of what our smaller hospitals are doing along these lines, I addressed a letter of inquiry to the superintendents of something over 60 New England hospitals having an average daily number of patients between 20 and 100. Replies were received from 25. Of these, seven stated that they either had no adequate system of records or that their method was entirely unsatisfactory. Four of these were just in the process of developing a new system which they hoped to put into effect in the near future. The remaining 18 sent more or less detailed accounts of their methods and of the difficulties they were experiencing in carrying them out. Twelve of these have apparently worked out fairly satisfactory systems and keep really good records. Six have inaugurated and are carrying out follow-up systems, and the other six would seem to be in a position to add this feature to their present systems without difficulty. Of the remaining six, two sent too little data to judge of the adequacy of their methods, and the other four described systems somewhat lacking in completeness and such as would require more or less radical change to make them satisfactory.

The clerical end of the work filing, cataloging, and so forth, was in practically every one

of these hospitals carried on by one person. In three instances it was stated that this person devoted her entire time to the work. In all other cases it was either stated or intimated that the clerk carried out these duties in conjunction with other hospital work. In one instance the work was done by two graduate nurses, each devoting but a part of their time to the records, and one hospital divided the work between the hospital bookkeeper, the telephone operator, and the superintendent's stenographer.

In response to the question of what difficulties were met with, not one hospital mentioned any trouble in getting the clerical part of the work done. The difficulties all seemed to be in getting proper reports of the histories, physical examinations, operations, etc. Seven hospitals were most concerned with their inability to obtain proper interest and cooperation on the part of the staff. Two mentioned the troubles caused by depleted staffs on account of the war, this, of course, being a purely temporary difficulty. Four complained of the difficulty of getting house-officers, and two were unable to get good records from the house officers they had.

All this, of course, with the exception of the shortage of house officers, points to a lack of interest and cooperation on the part of the doctors. It is obvious that we cannot have good records if we, in our position, as attending physicians, are not sufficiently interested and willing to do our share; but, on the other hand, no system is going to succeed which calls for too much time and attention to details on the part of the staff.

Hospitals, which through their location or other advantages, are able to get sufficient house officers, ought to have no real difficulty with this part of the work; but institutions where there are no internes or an insufficient number of internes have got to devise some method of having this work done, other than that of depending on the attending physicians to write out the records personally. Of course the first thing that suggests itself is to have a competent stenographer who will take down dictation at the time of the visit and after operations. This stenographer could also take care of the clerical part of the work and the details of the follow-up system. Unfortunately, this entails

an expense that many small hospitals are unable to stand. Another plan is the one that is employed at St. Vincent Hospital, Worcester, for the reporting of operations. This is the use of the dietagraph. I have not heard of this being tried in any other institution, but it seems to me that it might prove a convenient and practical method.

Several of the hospitals are making use of a nurse, trained to take histories and write out the reports of physical examinations, this latter under the direction or dictation of the attending physician, something after the manner of the old English clinical clerk.

Dr. Stetson, of Greenfield, writes me that he has found something of this sort for the Franklin County Hospital. In one hospital this is done by the laboratory technician, who is a graduate nurse.

The Springfield Hospital writes me: "We have evolved a scheme of keeping our records which seems to show good results, as at present, no patient can be discharged from the hospital until their record is complete. We have appointed a registrar, a graduate nurse, who has full charge of the records. When the patient is admitted, she takes the history, except in the case of venereal cases, when the house officer does it. We find, that with teaching and practise, a graduate nurse takes as good, if not a better history, than the average house officer. Furthermore, she *always takes it*. We have a blank form for the physical examination and the house officer makes this examination and records it."

In hospitals where there are no house officers the attending physician would have to fill in the physical examination form and he ought to have the chance of correcting the history before it is written in its final form. The reports of laboratory findings and so forth should, of course, be sent to the wards and kept there with the charts and records until the patient's discharge, when all parts of the records should be sent to the office for filing or binding. The nurse's notes of treatment may be kept on a separate sheet or in the margin of the history sheet. I believe that in the small hospital they are better kept in the margin.

The separate medication and treatment slips in use in some hospitals are more of a necessity in larger institutions where patients are more often transferred from one ward to another

and where orders written in an ordinary ward order book are sometimes incorrectly or incompletely copied. In the absence of house officers, notes on the patient's progress, the occurrence of complications, and so forth, may be recorded by dictation from the attending physician in a book provided for the purpose. These notes may then be transferred to the records by the ward nurse. When the completed records are sent to the office, upon the patient's discharge, they may be preserved for future reference, either in bound form or under the loose-leaf or jacket system.

My correspondents were about evenly divided in their preference between these two methods. Both have their advantages and disadvantages. The loose-leaf system offers the advantage of having all records of a given patient, no matter how often he may re-enter the hospital, kept together, but, if they are kept accessible for reference, there is danger of parts or whole of records being lost.

The bound method, of necessity, separates re-entry records from their original admissions, but in small institutions these re-entries are not very frequent and the necessary amount of cross referencing and looking up cases in separate volumes is not a very arduous task. As stated above, all this work of filing records together with the necessary cataloging, is carried on in most of the hospitals by one person, who devotes all or part time to this task. I believe the plan of having this work divided between a number of people is a bad one, as it tends to confusion.

Wherever a follow-up system is put in practise, I think it will be found necessary to have one person, whose whole time is devoted to record keeping. If a stenographer can be employed for this purpose, so much the better.

I have been able, in this short paper, only to outline, in a very general way, some of the ideas that may be adopted by the smaller hospitals for improving their systems of record keeping. Of course, no definite plan could be laid out that would suit the needs of all. Every hospital has its own particular conditions and problems and the details of its record system must be made to fit these.

#### DISCUSSION.

DR. HOMER GAGE, Worcester: I have been interested for a long time in this matter of hos-

pital records and am very much pleased with the paper of Dr. Stevens. There are various ways of keeping records that are perfectly satisfactory, but the important thing and the difficult thing is to get them written at all. From my personal observation of the small community hospitals throughout the State the majority of them have no records except the record of the patient's admission and the date of discharge, and sometimes the diagnosis; but often nothing but the date of admission and the date of discharge.

Now it is extremely important and will become necessary in every hospital as soon as the community becomes alive as to what the hospital ought to be doing for it, to have some accurate system to show at least that the patient has been seen and has been examined and what has been done for him.

My experience in an Army hospital has led me to believe that it is perfectly practicable to have a system of reports, and to hold the staff rigidly up to certain rules and regulations that in no way reflect on the qualifications of its individual members, but indicates clearly whether they are giving to the hospital the same sort of service that they are rendering to their private patients.

The board of trustees should demand a report of what has been done in the hospital from month to month or quarter to quarter.

We will suppose it is a small community hospital where the services are divided; at the end of three months, or for one month, a report should be made to the trustees of the number of patients that have been admitted, their length of stay in the hospital, the number of fatalities that have occurred in the service, whether medical or surgical, and in the surgical service, the number of cases of sepsis occurring in clean operations.

These are simple things, the Army gets them, and it is perfectly easy for the trustees of a hospital to get them. The trustees have accepted the responsibility of hospital management and have given over a certain duty to the staff. They should see that the staff performs that duty, and I think it is easy for them to do it without undue friction, to the great advantage of the community.

They have a right to demand and the staff has no right to refuse a regular report on the medical and surgical work of the hospital. And if the members of the staff are not willing to discharge that duty, those men should be dropped at the next election; a few wholesale changes will suffice for any community.

And my belief is that we can adopt some of the systems and reports and checks that the Army has taught us and adapt them to our civilian hospitals and secure much better results; and one thing that I want to emphasize is, that the responsibility for that rests on the staff.

The staff may delegate it to whomsoever they please,—to the superintendent,—and from whom they delegate it to, they should compel a report; and I think there is no reason why they should not receive it, and I believe in that way the record system can be much better than it is now.

Dr. C. H. Cook, Natick: Hospitals in small communities have both ward and private patients. Do these records include private patients?

Dr. HOMER GAGE, Worcester: Does the hospital hold itself responsible for that patient?

Dr. C. H. Cook, Natick: The hospital furnishes necessary care and nursing unless a special nurse be required; the medical and surgical treatment is ordered by the medical attendant in charge. No one would presume to demand that records of these patients be kept were they in their own homes; does that relation change because they are in a hospital? If so, how? By requiring hospital records to be kept, is not that privacy, to a greater or less extent, done away with? Under these conditions, will private patients, especially in the small cities and towns, be willing to go to hospitals? It is an open question with me whether or not trustees have a right to require or insist that such records be kept; whether they have a right to require details of the case to be preserved where, in the future, they are not under the control of either physician or patient. It may be the full intention to preserve the secrecy of those records but what guarantee can be given that will make the patient rest easy as to permanent secrecy?

Dr. H. P. Stevens, Cambridge: I think it is wrong to class hospital records as publicity. Any hospital with private or ward patients assumes a responsibility, and I think it is entitled to some fair record of that patient. These hospital records are not public property in any sense of the word; I think adequate records should be kept of private patients as well as ward patients.

Dr. C. H. Cook, Natick: There arises the question whether the physicians who send private patients to a hospital will be willing that all the details relating to these patients should be made a part of hospital records. The hospital requires that the physician's directions as to care be written in an order book provided for that purpose; of course the nurse's daily clinical record of administration of nourishment and remedies and daily bodily care, together with pulse, temperature, and respiration, must be kept, else the physician can have no intelligent understanding of the condition, but this is not what I understand by "adequate hospital records." It is to be assumed that the physician keeps records of his private cases for his own use and protection; if he does not, it is his own fault and he must suffer the consequences; but why is it



necessary or incumbent that the hospital also keep such records?

DR. WALTER G. PHIPPEN, Salem: The Salem Hospital takes care of both hospital and private cases and has kept records of both for many years.

There is another point: Dr. Stevens spoke of the dictagraph. We do not have a dictagraph, but the etherizer has a sheet which is part of the permanent record, on which must be written the report of the operation before the patient leaves the operating room, so that later, in looking up the case, you will find the operation reported correctly.

### Original Articles.

#### VENEREAL DISEASE AND THE PUBLIC HEALTH.\*

BY GEORGE GILBERT SMITH, M.D., BOSTON.

ACCURATE statistics regarding the amount of venereal disease in this country do not exist. Computations based upon local surveys give an approximate idea of its prevalence, but the results deduced by different writers vary so greatly that their value seems very doubtful. Fischer, quoted by Rosenau, estimates that there are 250,000 deaths in the United States each year due to venereal infection. Biggs, in 1912, stated that in New York City some 800,000 people, or more than one-fifth the adult population, had or had had venereal disease. Nor are adults alone affected: according to Pollack, there are every year in Baltimore from 800 to 1000 cases of gonococcus vulvovaginitis in little girls. Seippel believes that 500 cases occur annually in Chicago.

Osler gives fourth place in the list of fatal diseases to syphilis. Between 6000 and 7000 people die from this cause each year in England and Wales.

Interesting figures as to the prevalence of gonorrhea are found in the report of the Surgeon General of the Army for 1918. The proportion of recruits of draft age (21 to 31) who were found to have gonorrhea was between 2 and 3 per cent. Men from rural districts showed twice as much venereal disease as men from cities or thickly populated areas; colored troops showed two and one-half times as much

as white troops. Gonococcus infection is seldom fatal to men; it is important because of the effect it has when transmitted to women, because of the sterility, both in men and women, which it may bring about, and because of the vast amount of time lost from productive labor by those affected. You know without being told, the great number of operations upon women made necessary by gonococcus infection: you can imagine the suffering and the economic loss entailed thereby. Fifty per cent. of sterile marriages, according to Howard Kelly, are due to gonorrhea. As for the amount of time lost from work because of venereal disease, one has but to consider the fact that at the Massachusetts General Hospital alone, the 50 odd cases of gonorrhea who come daily for treatment lose 300 days per week or 15,000 days per year.

Add to the above losses the cost to each state of caring for its insane, one-fifth of whom have general paresis. Ninety per cent. of these show a positive Wassermann test. The feeble-minded who owe their mental deficiency to syphilitic taint, the children blinded by opthalmia neonatorum or by congenital lues, add to the burden of misery and human waste imposed upon us by venereal disease.

Within the past decade we have gradually awakened to a conception of this problem, and to a realization of the fact that it can be handled as other similar problems have been handled. For some years the American Social Hygiene Association has been working to undermine the inertia and the prudery which prevented a direct attack upon this problem. Public opinion has begun to show the effects of education. Venereal disease has been recognized as a menace to mankind.

This attitude of the public mind has been reflected by the legislatures and Health Departments of various states. In 1910 the legislature of South Carolina passed regulations dealing quite comprehensively with this question. Most significant is the provision for the reporting of persons with venereal disease whom "the attending physician or other person knows or has good reason to suspect is so conducting himself or herself as to expose other persons to infection, or is about so to conduct himself or herself." This regulation dealt a blow at "professional secrecy" by furnishing the physician a legal basis upon which he could stand in case

\* Read at the Medical Officers' Conference, U. S. A. General Hospital No. 9, May 14, 1919.

he felt it his duty to prevent a marriage because of the infectiousness of one of the parties.

February 20, 1912, the New York Board of Health adopted resolutions putting venereal diseases on the same basis as other infectious diseases. The public in general, however, slumbered peacefully so far as the question of venereal disease was concerned. Most hospitals still refuse to admit patients known to have trouble of this nature. Although there were plenty of laws by the authority of which health departments might have taken action in the matter, no action was taken. Prostitutes continued to ply their trade; they were arrested, fined, and sent out upon the streets again.

Then came war. Man power in a state of highest efficiency was in demand. The man who was not "fit to fight" was derelict to his duty. Americans had had the opportunity of studying conditions in the armies of our allies. We knew the danger to military forces from loss of effectiveness because of venereal disease, and expected that, unless precautions were taken, these infections would be immediately increased by the psychic reaction of war, by the abrupt change in environment, and by the hundred and one causes which make it easy to "let down the bars." At the very outset, therefore a campaign against venereal disease was started, with four main lines of attack. These were:

A. Social measures to diminish sexual temptation.

B. Education of soldiers and civilians in regard to venereal diseases.

C. Prophylactic measures against venereal disease.

D. Medical care.

Not least among these was the order that no man in the U. S. uniform should be given or sold liquor. More will be said later about the relation between alcohol and venereal disease. Let me say here that, although I have many times heard men in the army say that they had a fearful thirst, I have never heard anyone criticize the wisdom of the rule which prevented them from slaking it.

That these measures have been on the whole successful in keeping down the amount of venereal infection in the army there can be no doubt. The report of the Surgeon General quoted above does not contain figures showing the number of new infections apart from those

existing at entrance. It does state, however, that "the number of current venereal diseases in the Army Camps is remarkably small; and much less than the present components of the Army had before they were inducted into military service." (p. 197.) From my experience at Camp A. A. Humphreys, I should say that these conclusions are true. The mean annual admission rate for gonorrhea in the American forces in Europe is given in the report for 1918 at 36.24 per 1000, a rate which compares very favorably with those of other armies. If we assume that it takes 3 months to cure a case of gonorrhea, this rate means that less than one man in every hundred was constantly off duty because of urethritis.

Perhaps an even greater result of the attack by the army upon venereal disease has been the impetus which it gave to a similar crusade among the civil population. The focus was shifted from the army to the country at large, and although the measures employed must necessarily differ in many respects, they are still being followed with vigor. The Surgeons General of the Army, Navy, and Department of Public Health have together formulated a program.

The Federal government, by Act of Congress, approved July 9, 1918, created a separate Division of Venereal Diseases in the Department of Public Health. This division aims to coöperate in every way with the Health Departments of the several states. In pursuance of this aim, it has sent to 131,830 physicians in the U. S. pledge cards which they are asked to sign and return. The promise reads as follows:

1. To report my venereal disease cases in accordance with the laws and Board of Health regulations of my state.

2. To secure prompt treatment for all venereal cases that come to me, either treating them myself or referring them to a clinic or physician known by me to be competent in the treatment of such cases.

3. Not to dispense medicines which I prescribe in venereal cases, except when they cannot be obtained from a drug store; and not to recommend, prescribe, or sell any proprietary remedy marketed for the self-treatment of venereal disease.

4. To give to every venereal disease patient a circular of instructions, a supply of which is to be furnished me free of charge by the U. S.

Public Health Service or by my State Board of Health.

By March 15, 1919, 50,271 of these pledges were signed and returned. A copy of the Revised Manual for the Treatment of Venereal Disease will be sent to each one who has signed a pledge.

At the same time it created the Division of Venereal Diseases, Congress appropriated one million dollars to be expended through the State Departments of Health in venereal disease control during the year ending June 30, 1919. This sum is divided among the states in amounts varying from several thousand dollars to nearly \$100,000. Of the money granted to each state, 10% is to be used for administrative purposes, 50% for actual treatment, 20% each to repressive and to educational measures. A sample budget of \$30,000 would therefore be divided as follows:

		ADMINISTRATIVE		FOR TREATMENT	REPRESSIVE	EDUCATIONAL
Salary of State venereal disease officer .....		\$1500				
Salary of employees engaged in ven. dis. work .....		840				
Travel expense accounts .....		350				
Clerical hire .....		200				
Other expenses .....		100				
Salary of physician and attendants engaged in treatment .....			\$30000			
Cost of arsenphenin and other remedies .....			4000			
Equipment of clinic .....			1500			
Capital cost of detention hospital .....			15000			
Maintenance of same .....			5000			
Incidental expenses .....			500			
Expenses incurred in prosecuting doctors and others who fail to report cases .....				\$2000		
Salaries of investigators .....				2000		
Agents cooperating in law enforcements .....				2000		
Expenses of printing, preparing exhibits, lectures, etc. ....						\$5000

The campaign against venereal disease calls for the coöperation of the Federal Division of Venereal Diseases, the State Boards of Health, societies genuinely interested in this problem, and the individual practitioner. The plan consists of five subdivisions:

A. Securing of reports of venereal infections.

B. Control of those infected so as to prevent the further spread of the diseases.

C. Establishment of free venereal clinics.

D. Suppression of vicious conditions which favor the spread of venereal infection.

E. Carrying out of a systematic educational program for the general public as well as for those who are infected.

I will comment briefly upon each of these.

A. *Securing of reports of venereal infection.*—To thoroughly understand the situation and to direct the fight against venereal disease, accurate

statistics are essential. Such can be obtained only by the conscientious reporting of all cases of this sort—a procedure to which the medical profession, until recently, has been opposed. It has been argued that doctors would not report their cases for fear of driving them into the hands of the druggist or of the quack. Recent experiments along this line have not borne out these objections. Six states now require the reporting of cases of venereal disease by name and address. I do not know with what success they have met. In Massachusetts, each physician is required to report every new case by serial number. If the patient absents himself from treatment for six weeks, and is not going to some other doctor, or if he is so conducting himself as to be a menace to the public health, his physician is directed to report his name and address to the State Health Department. The latter will communicate with the board of health of the town in which the delinquent lives, and

will instruct them to induce, or even to force him to continue treatment. This applies only to persons having a disease in a communicable form.

The above scheme was instituted in April, 1918. In the ten months following its inception, 11,864 cases were reported in Massachusetts. This would seem to prove that we may expect coöperation between physicians and their boards of health. So far as the patient is concerned, I have never found one who objected after he understood the method employed in reporting his case, and the reasons for doing so. It is the sort of thing to which army men are accustomed; the attitude of discharged soldiers towards the reporting of venereal disease will be, I believe, one of coöperation rather than of hindrance, and will influence the rest of the population in favor of this measure.

B. *Control of those infected so as to*

*prevent farther spread of the disease.*—The reporting of cases of venereal infection, besides supplying information as to the extent of these diseases, provides a way of controlling foci of infection. If physicians and clinics do their duty, every case of venereal disease which applies for treatment must continue treatment until he or she becomes non-infectious. It may be argued that at present a considerable proportion of cases do not see a doctor at all, but get treatment from drug stores; and that these cases will not come under the registration at all. The truth of this cannot be denied; to meet the situation, the Federal Division of Venereal Disease is conducting among druggists a campaign to parallel their campaign among physicians. The object is, of course, to stop the sale of those drugs used chiefly in the treatment of venereal diseases, unless prescribed by a physician. From all points of the compass the carriers of venereal infection are being rounded up. When this process becomes complete, as it may within 15 or 20 years, venereal disease will be as rare as smallpox is now.

Quarantine, for the majority of those afflicted with venereal disease, seems quite unnecessary. On the other hand, the confinement of prostitutes found to be infectious (as 90% of them are) is highly desirable, for these carriers, because of their great sexual activity, are the chief disseminators of syphilis and gonorrhea. The professional prostitute is not alone in this; fully as much harm is done by the clandestine prostitute,—the girl who has a regular vocation, but a most irregular avocation. Of the venereal infections in the British Army 75% were contracted from clandestine prostitutes.

An effort has been made to find such carriers, both by the Federal government by means of the questionnaires in use in some camps, and by state health departments by means of the registration blanks for venereal cases. In both instances the patient is asked to name the person from whom the disease was contracted. Obviously this request will not be heeded in many cases; it is surprising, however, to find how many times the question is answered. If the patient is made to understand that the information is desired simply in order to bring the source of the infection under treatment and thereby to prevent others from getting infected, and that all these matters are confidential, he will be much more likely to answer.

*C. Establishment of free venereal disease clinics.*—It is not enough to identify the carriers of infection; it is even more necessary to provide for such of these as are not well off financially adequate facilities for treatment. As has been shown, the Federal Government is interested in the establishment of venereal clinics. In Massachusetts, the State Department of Health has instituted a series of ten venereal centers, under the supervision of a competent venereologist, where will be provided diagnostic facilities for the early recognition of syphilis and gonorrhea, and the medical and material equipment necessary for their treatment.

It must be remembered that even though every facility for treatment is provided there are still many patients who cannot afford to spend the morning or afternoon in a clinic. Their jobs will not stand for this. The logical solution, which is not particularly pleasing to the physician, is the establishment of evening clinics. Several of these have been in operation for some years in New York and in Boston. At the Boston Dispensary, a charge of 50 cents per visit is made. This supplies enough income to pay salaries to the doctors who spend two or three evenings a week at the clinic.

The free centers for the diagnosis and treatment of venereal disease which were established in England in 1916 to meet the increase of venereal infection and the scarcity of medical men have been operated with increasing success. Every dollar spent in providing similar facilities in this country is a gilt-edge investment, bound to return many times its value by the checking of human waste. Let it be thoroughly understood that these clinics must be really adequate to the needs of the people whom they are intended to serve, both from the standpoint of scientific treatment and from that of economic consideration.

*D. Suppression of vicious conditions which favor the spread of venereal infection.*—This aspect of the problem presents many difficulties. The diffusion of prostitution, its insidiousness, its antiquity, discourage those who would suppress it. One thing is sure: that is, segregation and the so-called control of prostitution do not answer the needs of the situation. Abraham Flexner has shown the fallacies of this system as it is practised in Europe. Prostitution is a matter of supply and demand. The demand

must be decreased by far-reaching social changes. For one thing the wages of young men must be sufficient to enable them to marry earlier. The supply of prostitutes must be decreased through better supervision of amusements, such as public dances; by the more sympathetic treatment of early offenders; by the instruction of girls in sexual hygiene. As business opportunities for women increase, it is probable that the proportion of professional prostitutes will grow less, that of the clandestine type will grow more.

The statement made in 1912 by Colonel Maas is profoundly true—that "venereal diseases are intimately associated with two of the most prominent sociological problems of the age, alcoholic addiction and prostitution." It is my own belief that the prohibiting of distilled liquors, if it can be thoroughly enforced, will deal a staggering blow to prostitution. At the same time, it will go far towards preventing the dissemination of venereal disease. Many men and women who ordinarily would not yield to sexual desire, do so when under the influence of comparatively little alcohol. Others, who do not hesitate at promiscuity but who usually exercise precautions against infection, omit these precautions when intoxicated. The establishment of prohibition, unpleasant as it is for those who understand moderation in the use of alcohol, should nevertheless be supported by every thinking individual, if for no other reason than because of the certain decrease in venereal infection which it will bring about.

*E. Carrying out of a systematic educational program for the general public as well as for those who are infected.*—In preventing the dissemination of venereal disease much depends upon the action of the individual. It stands to reason that education of the individual in the nature of these diseases, and in the facts of sex hygiene in general, is of the greatest importance. The value of education is emphasized by the Surgeon General of the Army in his report for 1918. The Government has distributed 5 million pamphlets and leaflets explaining its social hygiene program. I have already mentioned the Federal appropriation to be divided among the several states; of this, 20% is to be expended for educational purposes. Education is carried out by means of pamphlets, lectures, and exhibits. Perhaps even more is accomplished by the enforce-

ment of laws dealing with matters of social hygiene, such as the law for reporting cases of venereal disease.

The government has prepared two films upon this topic—"Fit to Fight"—which is intended chiefly for troops, and another film which is for use in civil communities to aid in the education of women and girls. One or two commercial pictures dealing with venereal disease which I have seen seemed to be of very little value from the educational point of view, but of considerable value, perhaps, from that of the box office.

Education in all matters pertaining to sex should be, as Rosenau says, "clear, pointed, brief, and direct." It should be as impersonal as possible, except when appealing to the best instincts of the individual. Above all, exaggeration for the sake of being impressive must never be employed.

Not least among measures to check the spread of venereal infection is the education of the infected individual. This is not a case of locking the stable door; education of the infected individual aims to show him how he may achieve a complete cure, and to secure his coöperation in the protection of the community while he is infectious.

How much stress to lay on the matter of personal prophylaxis is difficult to know. As has been very justly said by someone—I think it was Ex-President Eliot—there is a certain incongruity in approaching youth with a Bible in one hand and a prophylactic outfit in the other. Without any question, prophylaxis is a most valuable defense against the spread of venereal disease. The employment of this measure in the U. S. Army has reduced the rate of those non-effective because of venereal disease from 23.23 per 1000 in 1909, when prophylaxis was instituted, to 4.44 per 1000 in 1916. It might be said that because venereal prophylaxis does not protect with absolute certainty, its use begets a false confidence, or that advertisement of its advantages may lull the fear which sometimes (though not often) holds desire in check. Neither of these arguments seems to me to offer any real objection to its use. We must admit what everyone knows—that indiscriminate intercourse always has, and probably always will, occur. Therefore, opportunities for taking prophylaxis should be freely available. Four million men going from our armies to every corner of the land know its advantages and that its

use was demanded when they were in the army. They will demand it now, for the sake of the public health if not for their own.

### GASEOUS EXCHANGE WITH UNPRACTICED SUBJECTS AND TWO RESPIRATORY APPARATUS EMPLOYING THREE BREATHING APPLIANCES.

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(Continued from page 296.)

#### UNIFORMITY OF DUPLICATE MEASUREMENTS IN REGARD TO RESPIRATION APPARATUS AND BREATHING APPLIANCE.

In any research, as well as in clinical application of the results, the investigator is concerned with two problems, *viz.*, what are the actual variations involved and how closely can the method used measure these variations. Naturally, two factors enter into any consideration of these problems, *i.e.*, the duplication of the physiological condition and the adequacy of duplicate measurements for the purpose concerned if the conditions remain constant. The possibility of duplication of results in relation to time is considered later. In this research we have attempted to arrange the duplicate determinations in such a manner that the question of time of day, breathing appliance, or respiration apparatus would in no way affect our conclusions. We had two respiration apparatus and three breathing appliances, and thus the possibility of six combinations. We employed six different sequences of experimenting. Owing to technical difficulties it was not possible at times to carry out our original plan of using three subjects with each of the six sequences of periods. From previous experience with respiration apparatus in general<sup>15</sup> and the results obtained here, we feel that the data presented in our tables are in no way affected statistically or physiologically by the deviation from our original plan.

Table V has been prepared primarily with reference to technical possibilities of duplication of results. The values in the table are arranged first as to respiration apparatus: sec-

ond, breathing appliance as used with either respiration apparatus; third, averages of first and second periods; fourth, averages of individual differences between first and second periods. The table therefore involves differences in respiration apparatus and differences in breathing appliances as far as the average uniformity is concerned between the measurements in two periods with the different respiration apparatus and breathing appliance.

*Carbon-Dioxide Elimination.* The agreement of the duplicate averages with each breathing appliance, regardless of respiration apparatus employed, is all that could be expected, with the exception of those for the mask in combination with the respiratory-valve apparatus. The averages of the individual differences between the first and second periods are highest with the portable apparatus and nosepieces and lowest with the respiratory-valve apparatus and the mask. The average of the individual differences between the first and second periods with the respiratory-valve apparatus and mask corresponds more closely with the differences between the averages of the first and second periods than with any other combination of breathing appliance and respiration apparatus.

*Oxygen Absorption.* The data for oxygen consumption show that the best agreement on the average between two measurements is with the portable apparatus and mask and the next best is with the nosepieces and either apparatus. The poorest is with the respiratory-valve apparatus and the mouthpiece, but the range in the average differences between any two duplicate measurements is from 1 to 6 c.c. The averages of the individual differences vary from 5.7 c.c. with the portable apparatus and nosepieces to 14.8 c.c. with the respiratory-valve apparatus and mouthpiece. In general these differences are less with the portable apparatus than with the respiratory-valve apparatus, irrespective of breathing appliance used.

*Respiratory Quotient.* The agreement on the average between the first and second measurements does not differ materially with any combination of breathing appliance and respiration apparatus. The lowest values are with the mask and respiratory-valve apparatus. The best average agreement and the lowest average of individual differences is with the mouthpiece and respiratory-valve apparatus.

*Pulse Rate.* The range in the differences be-

TABLE V.—AVERAGES OF ALL MEASUREMENTS WITH RESPECT TO THE FIRST AND SECOND PERIODS WITH EACH BREATHING APPLIANCE AND AVERAGES OF THE INDIVIDUAL DIFFERENCES BETWEEN THE FIRST AND SECOND PERIODS OF MEASUREMENT.

APPARATUS AND BREATHING APPLIANCE	CARBON DIOXIDE	OXYGEN	RESPIRATORY QUOTIENT	PULSE RATE	RESPIRATION RATE	VOLUME PER MINUTE	VOLUME PER RESPIRATION	EXPIRED AIR	
	c.c.	c.c.				liters	c.c.	%	%
<i>Portable respiration apparatus</i>									
Nosepieces, av. of first periods ..	205	236	.87	63	13.4	5.62	534	3.67	4.21
Nosepieces, av. of second periods ..	204	238	.86	62	13.7	6.19	564	3.42	3.96
Nosepieces, av. of differences between periods* ..	16.1	5.7	.076	3.9	.9	1.01	71	.45	.67
Mouthpiece, av. of first periods ..	204	237	.86	65	14.4	6.28	537	3.55	3.88
Mouthpiece, av. of second periods ..	207	240	.87	62	14.6	6.32	545	3.52	3.86
Mouthpiece, av. of differences between periods* ..	12.4	8.8	.040	2.6	1.3	1.02	96	.46	.58
Mask, av. of first periods ..	195	237	.83	65	15.4	7.28	584	2.77	3.29
Mask, av. of second periods ..	195	238	.82	63	15.2	7.10	573	2.80	3.44
Mask, av. of differences between periods* ..	9.1	7.2	.040	3.5	.9	.88	52	.35	.31
<i>Respiratory-valve apparatus</i>									
Nosepieces, av. of first periods ..	188	220	.82	66	14	4.91	442	3.90	4.72
Nosepieces, av. of second periods ..	187	231	.81	64	14.1	4.88	436	3.88	4.75
Nosepieces, av. of differences between periods* ..	9.1	7.2	.033	3.4	1	.33	40	.16	.30
Mouthpiece, av. of first periods ..	194	234	.83	66	14.5	5.33	460	3.67	4.43
Mouthpiece, av. of second periods ..	197	240	.83	64	14.3	5.38	469	3.72	4.49
Mouthpiece, av. of differences between periods* ..	12.3	14.8	.024	2.6	1.3	.31	47	.09	.15
Mask, av. of first periods ..	190	234	.81	66	14.5	5.67	482	3.38	4.15
Mask, av. of second periods ..	182	231	.79	64	13.5	5.38	497	3.46	4.33
Mask, av. of differences between periods* ..	8.1	8.5	.025	3.2	1.9	.36	55	.15	.22

\* This is calculated by averaging all the daily differences between the first and second observations.

tween the averages of the first and second periods is one to three beats per minute. Average pulse rate is rather difficult to obtain, and under the conditions of our measurements it may be questioned whether a difference of three beats per minute between the averages of the first and second measurements is sufficiently large to be significant. The lowest average of the individual differences (2.6) between the first and second periods is with the mouthpiece on both apparatus. The highest (3.9) is with the nosepieces and portable apparatus, with a range between the highest and lowest of only 1.3.

**Respiration Rate.** The best agreement of the averages of the first and second periods with any one of the six combinations is for the nosepieces and respiratory-valve apparatus (14.0 and 14.1) and the poorest is with the mask and respiratory-valve apparatus\* (14.5 and 13.5). The latter is a difference of one respiration per minute, and the next lower (nosepieces and portable apparatus) shows a difference of 0.3 respiration per minute; that is, that five out of six show a range of 0.1 to 0.3 respiration

per minute. The lowest average of the individual differences between the first and second periods (0.9) was obtained with the portable apparatus, for both the nosepieces and mask. The highest (1.9) is with the mask and respiratory-valve apparatus. The ratio of the difference between the averages of the first and second measurements and the average of the individual differences between the first and second measurements is highest with the nosepieces and respiratory-valve apparatus, and lowest with the mask and respiratory-valve apparatus.

**Respiratory Volume Per Minute.** The highest average volume per minute is that for the mask and portable apparatus. The poorest agreement for the averages of the first and second periods is shown for the nosepieces and portable apparatus (5.62 and 6.19-liters), and the best for the nosepieces and respiratory-valve apparatus (4.91 and 4.88 liters). The highest average of the individual differences between the first and second periods is with the portable apparatus for both the nosepieces and the mouthpiece (1.01 and 1.02 liters). The lowest averages are with the respiratory-valve

\* Attention should be called here to the fact that normal unrestricted respiration is very irregular and consequently uniformity of respiration rate is not necessarily an indication of normality of breathing.

apparatus and all three breathing appliances (0.33, 0.34, and 0.36 liter).

*Volume Per Respiration.* The highest volume per respiration is with the mask and portable apparatus, and the lowest with the nose-pieces and respiratory-valve apparatus. The greatest difference between the averages of the first and second periods is with the nosepieces and portable apparatus (30 c.c.); the lowest with nosepieces and respiratory-valve apparatus (6 c.c.). The highest average of the individual differences between the first and second periods is with the mouthpiece and portable (96 c.c.), and the lowest is with the nosepieces and respiratory-valve apparatus (40 c.c.). In general, this average is lower with the respiratory-valve apparatus than with the portable apparatus.

*Carbon-Dioxide Percentage in Expired Air.* The greatest differences between the averages of the first and second periods is with the nosepieces and portable apparatus (0.25 per cent.), and the lowest with the nosepieces and respiratory-valve apparatus (0.02 per cent.). The greatest average of the individual differences is with the mouthpiece (and nosepieces as well) and portable apparatus (0.46 and 0.45 per cent.). The lowest is with the mouthpiece and respiratory-valve apparatus (0.09 per cent.).

*Oxygen Deficit of Expired Air.* The greatest difference between the averages of the first and second periods is with the nosepieces and portable respiration apparatus (0.25 per cent.). The lowest is with the mouthpiece and portable apparatus (0.02 per cent.). The highest average of the individual differences is with the nosepieces and portable apparatus (0.67 per cent.); the lowest, with the mouthpiece and respiratory-valve apparatus (0.15 per cent.).

With the foregoing discussion in mind, we may ask: What combination of respiration apparatus and breathing appliance will insure the closest duplication of results so far as all of the measurable physiological indices of metabolism and respiration are concerned? A critical examination of table V convinces us that the best combination in this respect is the nosepieces and the respiratory-valve apparatus. Physiologically the combination of the mask and the respiratory-valve apparatus is the next to be preferred, and the poorest is the nosepieces and portable respiration apparatus. All of this discussion is based upon the reliability of the

whole series of measurements, and in no respect upon a single physiological measurement.

#### GENERAL FEATURES OF THE RESULTS AND THEIR SIGNIFICANCE.

We have discussed the actual results as shown by tables II to V, inclusive. In that discussion only the actual mathematical differences were, in the main, considered, but here it is our aim to show the significance of the results obtained.

Considering first the oxygen absorption we find that there appears to be no real difference between the results obtained with the portable apparatus and those found with the respiratory-valve apparatus. With the breathing appliances, the lowest results were found with the nosepieces and mask, and the highest with the mouthpiece, but the range on the average is very small, viz., 235 to 238 c.c. per minute. (See table IV.) From the standpoint of oxygen consumption alone, it is difficult to say which of the two respiration apparatus or which of the breathing appliances is to be recommended. From the standpoint of technique, when the periods are short the mouthpiece is recommended for both apparatus: with the respiratory-valve apparatus the mask may also be used. The question may be asked: Why are not the nosepieces recommended? Technically, they are the most difficult of the three breathing appliances to keep in prime condition. From this standpoint the mouthpiece is to be preferred, because if the subject obeys all the conditions (wakefulness and tight closure of mouth), there is no obvious leak with either type of apparatus. From the standpoint of involuntary or normal breathing, the mask is best. Technically it is less suitable for use with the portable apparatus, but is as good as any other breathing appliance for the respiratory-valve apparatus. To sum up, the oxygen absorption is independent of the respiration apparatus or breathing appliance used; the mask is to be preferred with the respiratory-valve apparatus, and the mouthpiece with the portable apparatus.

The carbon-dioxide elimination is of significance when we wish to consider the effect of the apparatus used and the value of the respiratory quotient in the sense in which it is ordinarily understood. Our question here is: What are the actual variations found, together



with their causes, and what apparatus shall we use to measure both of these factors? Tables III, IV, and V indicate that on the average the highest carbon-dioxide measurement is with either the nosepieces or mouthpiece and portable respiration apparatus, and the lowest is with the nosepieces and respiratory-valve apparatus. We conclude that nose-breathing with the respiratory-valve apparatus gives us the lowest value on the average, and that mask-breathing with the respiratory-valve apparatus approaches most nearly to this value, and both nose and mouth-breathing with the portable apparatus give the highest results. For accurate determinations of carbon-dioxide elimination, therefore, the respiratory-valve apparatus and the mask are to be preferred.

The respiratory quotient is ordinarily considered as an index of the character of metabolism, but the influence of the conditions of measurement upon the results is usually not taken into account. An examination of the individual respiratory quotients and the averages of respiratory quotients for the three breathing appliances and the two respiration apparatus used will reveal rather wide differences. It must be recalled here that a breathing-appliance respiration apparatus designed for short experimental periods involves all the variations in the respiratory quotient due to the breathing appliance used, principle of respiration apparatus, coöperation of subject, and actual possible change in this ratio. In addition we should remember that one of the two respiration apparatus was not designed primarily for the determination of the respiratory quotient, *viz.*, the portable apparatus.

The respiratory quotients obtained with nosepieces or mouthpieces and the portable respiration apparatus are higher than those secured with the mask in combination with the same apparatus. On the respiratory-valve apparatus the nosepieces and mask give slightly lower results than the mouthpiece, those with the mask being the lowest. The respiratory-valve apparatus gives the lowest respiratory quotient on the average with all breathing appliances. Thus we find that of the three breathing appliances, the mask gives the lowest respiratory quotient, the nosepieces the next lowest, and the mouthpiece the highest, also that the respiratory-valve apparatus on the average gives the lowest values for the res-

piratory quotient, irrespective of the breathing appliance used.

In seeking for the possible causes of these variations, either for breathing appliance or respiration apparatus, we are led to consider in advance certain other measurements, *viz.*, total ventilation, respiration rate, volume per respiration, and composition of expired air, as well as possible technical errors.

The possible and probable technical errors will be considered first. The respiratory quotient with the portable respiration apparatus is dependent upon the measurement of the carbon dioxide by absorption, which involves weighing, and upon the measurement of oxygen by determining the contraction of a given volume of circulating air which the subject respires. Possible technical errors in the carbon-dioxide measurement are those due to erroneous weighings or to deficient absorption in the first calcium-chloride bottle, *i.e.*, escape of unabsorbed water vapor which may thus be absorbed in the soda-lime bottle or the calcium-chloride bottle following it.

Calcium chloride has not been used heretofore for the absorption of such large amounts of water as are here involved from a current of air moving at the rate here used, *viz.*, 20 to 35 liters per minute. Tests have been carried out on 16 experimental days to determine whether the first calcium-chloride bottle was an efficient absorber for the water vapor which might reach it from the air expired by the subject and from the water bath surrounding the bell of the spirometer. One of us (L. E. E.) devised a method of experimenting which would satisfy all the conditions of an actual respiration experiment and at the same time determine the actual efficiency of the first calcium-chloride bottle. The method was to conduct an actual respiration experiment with the order of the absorption bottles changed. The usual order is calcium chloride, soda lime, calcium chloride, but the order in these tests was calcium chloride, calcium chloride, soda lime. It will be seen that if an appreciable amount of water escapes absorption by the first calcium-chloride bottle, it is likely to be caught by the second, provided the latter is not very deficient. Our practice was to employ as the first calcium-chloride bottle the one which had been used in the same position during the morning series of respira-

tion experiments, and to use for the second bottle that which previously followed the soda-lime bottle. It will be also recognized that the soda-lime bottle served the same purpose as during the morning experiments, *viz.*, the absorption of carbon dioxide.

The routine of the test was to weigh the two calcium-chloride bottles, connect them up in the apparatus, conduct a 15-minute respiration experiment, and weigh the calcium-chloride bottles at the end. The gains in weight of the first bottle ranged from 2.72 grams on April 18 to 10.10 grams on April 5. The majority of the gains in weight of the first bottle were about 4.5 grams. The gains in weight of the second calcium-chloride bottle ranged from 0.00 on April 30 and May 2 to 0.22 gram on April 18. The average gain of the second bottle was 0.067 gram. About two-thirds of the tests gave results below 0.08 gram. On April 20, the gain was 0.20 gram; April 27, 0.18; and in all other tests less than 0.10 gram. If we accept the highest value, namely, 0.22 gram, we find that this corresponds to about 0.110 liters of carbon dioxide, and if a period is considered as 12 minutes, this would correspond to 9 c.c. per minute of carbon dioxide. Assuming 200 c.c. as the average of carbon dioxide eliminated and 250 c.c. as the oxygen absorbed, the respiratory quotient is 0.80. Adding to the carbon dioxide 9 c.c. changes the respiratory quotient to 0.836, a positive change. The average gain in weight of the second calcium-chloride bottle in the efficiency tests, however, is equivalent to only about 35 c.c., *i.e.*, 2 to 3 c.c. per minute. This amount has no significance in the respiratory quotient values. Consequently we conclude that in the majority of our experiments, the possible inefficiency of the first calcium-chloride bottle can be neglected. This factor is not the primary cause of the difference between the two respiration apparatus in the elimination of carbon dioxide or in the respiratory quotient.

A second technical factor to be considered with the portable respiration apparatus is the determination of the oxygen consumption. The principle (as emphasized before) is the contraction in the volume of air respired by the subject. It involves two factors, one, whether the conditions at the starting and ending points are the same; and, two, whether there is any possibility of change in the circulating current

of air due to causes other than the actual absorption of oxygen, such as leaks. So far as the first is concerned, the apparatus itself plays no significant rôle, the chief point to be considered is the regularity in the depth of breathing. As a control upon this and to obtain a graphic record of the total ventilation, we have used a record of the movements of the spirometer bell. A recognition of the principle of the portable apparatus will show that this must necessarily be a slanting record, and if the assumption of physiological principle involved is correct, *viz.*, the constancy of the volume of air in the lungs at the end of expiration, the lower side of the kymograph record of movements should present a slant which is fairly regular.\*

We have secured such records for all of our experimental periods with the portable respiration apparatus, and a critical examination of these convinces us that while, with some individuals, there may be rather large variations from one respiration to another, the possible difference which may occur between the first and last respirations of a single 12 to 15-minute period is not great enough to affect significantly the oxygen consumption. A further substantiation of this is the fact that the data for the oxygen consumption secured by the Emmes method<sup>17</sup> agree, in the majority of cases, remarkably well with the values obtained in the usual way. Consequently, the conclusion is that the variations in the volume of the respiratory tract at the end of a normal, involuntary respiration play no significant rôle in the determination of oxygen absorption with a closed-circuit breathing-appliance respiration apparatus. As a corollary to this conclusion we recommend very strongly the adoption of the Emmes technique in the determination of the oxygen consumption with the portable respiration apparatus. It is an admirable control, both physiologically and technically.

Therefore, our conclusion is that from the technical standpoint alone, the differences with the portable respiration apparatus in the respiratory quotient and the carbon-dioxide elimination are not explainable.

The technical errors possible in the use of the respiratory-valve apparatus are next to be

\* An actual example is shown in Carnegie Inst. Wash. Pub. No. 216, 1915, fig. 14, p. 49.

considered. The principle involved is a measurement of the volume of expired air and the determination of its composition.

The measurement of the expired air for this apparatus is technically rather simple, namely, the collection of the whole amount expired, with observations as to the conditions under which it is collected, *i.e.*, barometric pressure, temperature, humidity, and mechanical accuracy. All of these conditions have been considered in some detail in a monograph<sup>18</sup> from this laboratory, and technically we assume that all requirements are satisfied. So far as the composition of expired air is concerned, the Haldane apparatus used were controlled daily and, in addition, a statistical analysis of the gas analyses involved in this work indicates that less than two per cent. of the analyses for carbon dioxide show a difference in parallels greater than 0.05 per cent. and that less than four per cent. of duplicate oxygen determinations shows a difference greater than 0.05 per cent. The maximum difference in duplicate determinations of the carbon-dioxide percentage is 0.06 per cent. and with the oxygen percentage 0.10 per cent. The number of periods involved is 102. In no case was it necessary to reject results owing to faulty gas analysis.

The differences between the two respiration apparatus in the values for the respiratory quotient are therefore not due to faulty technique with either apparatus.

The differences in the quotients obtained with the three breathing appliances as used with the respiratory-valve apparatus cannot be due to technique, because the same method of determining the composition of the expired air was employed in each case, *i.e.*, gas analysis. Furthermore, the differences in the quotients are not significant. With the portable apparatus, there are opportunities for variation in the respiratory quotient due to leaks in the breathing appliance. In this respect the mask is the least satisfactory. Indeed, it was with some lack of confidence that we combined it with the portable apparatus in this comparison series, for though a very small leak might not affect appreciably the results with the respiratory-valve apparatus, it would have a positive effect upon those with the portable apparatus. We were obliged to reject but one period in this research because of evidence of a leak.

The mouthpiece is the most satisfactory breathing appliance from the standpoint of tightness, while the nosepieces are fairly so. The results obtained with the portable apparatus in the measurement of the oxygen absorption do not give indications of erroneous values due to leaks with any of the breathing appliances.

The differences in the average respiratory quotients are, accordingly, not due to faulty technique with either respiration apparatus or breathing appliance.

For the explanation of these differences we must therefore look for possible physiological causes. The greatest cause for differences in respiratory exchange in the various experiments is the character of the respiration. The physiological indices are the respiration rate, volume of respiratory ventilation, volume per respiration, and composition of expired air. An examination of the respiration rates shows no significant differences with either the two respiration apparatus or the three breathing appliances. The range of averages is from 13.4 to 15.4. Consequently any differences between the two sets of results cannot be ascribed to changes in respiration rate. The values for volume of respiratory ventilation show, on the other hand, marked differences on the average between the two respiration apparatus. The volume with the portable apparatus is slightly over one liter greater than with the respiratory-valve apparatus. With the respiration rate practically constant, this would give a higher volume per respiration, this being the case as the average results with the portable were 556 c.c. as compared with 464 c.c. with the respiratory-valve apparatus. A deeper respiration would tend to bring out more carbon dioxide, thus raising the respiratory quotient. These facts are corroborated by the figures for the percentage of carbon dioxide in the expired air. This leads to the conclusion that the higher average respiratory quotient with the portable respiration apparatus is due to the larger total amount of air respired and greater depth per respiration. In other words, there is a tendency toward a slight over-ventilation of the respiratory tract. It may be questioned as to why the difference should not be considered as due to an under-ventilation with the respiratory-valve apparatus. In the first place there are no definite experiments to prove that

underventilation is likely to take place with any respiration apparatus employing breathing appliances, provided the subject is wide awake and is not conscious of his breathing, that is, it is wholly involuntary. The only condition in which there seems to be a diminished ventilation is that existing in the transitional period between sleep and wakefulness. It is also the experience of the majority of experimenters with all types of breathing apparatus that with untrained subjects there is a great tendency toward overventilation. Another indication leading to the conclusion adopted is the fact that there is a much greater mean difference for the first and second determinations with the portable apparatus than with the respiratory-valve apparatus, and the interpretation drawn from these values is that there is therefore greater irregularity in breathing.

It should not, however, be concluded or assumed that it is not possible to obtain respiratory quotients with the portable apparatus which agree well with those found with the respiratory-valve apparatus. Attention is called to the results given in table II, which shows that with about one-third of the subjects, the respiratory quotients were practically the same on the average with both apparatus, these subjects being T. H. N., J. F. T., F. S., W. F. M., C. F. M., and R. K. B. Attention should also be called to the fact that the greater tendency toward irregularity in breathing with the portable respiration apparatus in no wise affects its value as an instrument for determining the absorption of oxygen.

The general conclusion is that the greater carbon-dioxide elimination and larger respiratory quotient with the portable respiration apparatus are due to a cause whose physiological effect tends to make the subject breathe deeper when attached to the portable respiration apparatus, and that the breathing appliance with which this is the least is the mask. This conclusion is derived from the facts obtained from the measurements of the respiration rate, total ventilation, and composition of expired air and their correlations.

#### RELATION OF THE RESPIRATORY QUOTIENT AND OXYGEN ABSORPTION TO THE PERIOD OF THE DAY.

One of the questions concurrently studied in this research was whether or not the respiratory

quotient changed its level in the period of time between 8.30 A.M. and 12.30 P.M. A still more important problem was the general trend of the total metabolism of a subject at rest, and in the post-absorptive condition between the hours of 8.30 A.M. and 12.30 P.M., as represented by the oxygen absorption.

In table VI, the respiratory quotients obtained with the respiratory-valve apparatus (see previous discussion of the respiratory quotient) have been arranged in order of time without respect to the breathing appliance used. The beginning times for the periods were approximately twenty minutes apart, so that the total time covered in the observations with each subject was about four hours.

The averages show the highest quotient (0.83) was found in the fifth and sixth periods and that the lowest (0.79) was obtained in the ninth and tenth periods, with 0.81 for the last two periods as compared with 0.82 in the first two periods. The first half of the morning has an average of .082 as compared with an average of 0.81 in the last half. An examination of the quotients for the individual subjects shows that there are nine subjects with whom the last quotient for the morning is as high or higher than that for the first period. The omission of the widely varying values for H. O. and P. G. H. does not alter materially the course of the average for the morning. Our conclusion, based upon table VI, is that there is really no significant change in either direction in the respiratory quotient of a subject in the post-absorptive condition during the period of the day extending from 8.30 A.M. to 12.30 P.M.

TABLE VI. RESPIRATORY QUOTIENTS IN CHRONOLOGICAL ORDER (RESPIRATORY-VALVE APPARATUS).

SUBJECT	DATE	PERIODS OF EXPERIMENT									
		1 and 2	3 and 4	5 and 6	7 and 8	9 and 10	11 and 12				
J. A. C.	Apr. 8	.76	.79	.83	.77	.72	.70				
C. A. C.	" 9	.81	.81	.79	.79	.78	.77				
H. H. H.	" 10	.84	.85	.83	.82	.82	.83				
T. H. N.	" 11	.79	.80	.80	.79	.81	.81				
J. F. T.	" 12	.86	.85	.83	.82	.80	.80				
A. G. N.	" 15	.78	.77	.86	.85	.77	.87				
J. L. G.	" 16	.87	.78	.84	.81	.78	.80				
F. S.	" 17	.83	.82	.78	.81	.77	.78				
W. F. M.	" 18	.82	.81	.85	.81	.84	.84				
S. N. G.	" 23	.76	.79	.79	.76	.81	.82				
W. J. S.	" 25	.77	.77	.79	.76	.84	.83				
C. S. B.	" 26	.78	.79	.79	.82	.75	.79				
H. O.	" 30	.97	.76	.86	1.03	.67	.83				
P. G. H.	May 1	.84	.95	.92	.86	.88	.91				
C. F. M.	" 2	.83	.82	.81	.82	.79	.84				
R. K. B.	" 3	.86	.86	.81	.77	.81	.80				
H. R.	" 6	.85	.82	.82	.81	.83	.82				
Average		.82	.81	.83	.82	.79	.81				

If the measurement of the oxygen consumption alone is to give an index of the total metabolism, the following conditions and assumptions are necessary: That the respiratory quotient does not change materially in the time of measurement; that, in this research, there is no difference in the measurement due to the apparatus used; that the subject maintains the same degree of tone (internal activity plus absence of visible muscular activity); and that the results are not influenced by apprehension, lack of practice, or effect of continued experimenting. The question we have to consider is whether or not there is a real change in the totality of the energy metabolism which can be indicated by the measurement of the oxygen consumption alone if subjects are attached to either a respiratory-valve apparatus or the portable apparatus, and any one of three breathing appliances used, *viz.*, nosepieces, mouth-piece, or mask.

Evidence as to actual constancy in the oxygen consumption from period to period during the hours from 8.30 A.M. to 12.30 P.M. of subjects at rest in the post-absorptive condition has been submitted from this laboratory in a monograph<sup>10</sup> recently published, in which the oxygen consumption by periods, on dates extending over parts of two to five years, is given for three subjects. These data are not so complete on every experimental day as one might desire, but indicate on the average that there was no material change in the course of the oxygen consumption during these hours.

We have already considered the variation in the values due to the type of respiration apparatus used and to the use of any one of the three breathing appliances, and have stated that we believe there is no significant difference in the values for the oxygen consumption, on the average, due to the respiration apparatus or breathing appliance used. Consequently, the range of values found by us with the different combinations of breathing appliance and respiration apparatus includes all the possibilities of technical errors as well as actual changes in the total metabolism.

A factor which also affects the actual values of oxygen absorption is the character of the materials oxidized. If the proportion of carbohydrate, fat, and protein catabolized varies, and indeed, what has hitherto been but little considered, if the anabolism of fat changes, the

actual value of the oxygen consumption must change, even if the total energy metabolism remains constant. This question is quite apart from the problem of how much error is involved in neglecting the protein metabolism in calculating the total metabolism.<sup>20</sup> The calorific values of oxygen in the combustion of fat and carbohydrate are the usual extremes. Any change in the relative proportions of the catabolism of these materials, even though the total metabolism remains constant, must alter at least in a slight degree the total oxygen absorption. When we have pathological conditions in which there is abnormal catabolism, the effect may become even greater. All this discussion has to deal with the constancy of respiratory quotients in the hours between 8.30 A.M. and 12.30 P.M. with subjects at rest in post-absorptive condition. The most difficult factor of total metabolism is to determine the respiratory quotient when it is considered not solely as the mathematical ratio between carbon dioxide exhaled and oxygen absorbed, but in addition it is considered as the ratio between the carbon dioxide produced and the oxygen required by the materials actually burned in the body at the time of measurement, *i.e.*, "combustion index."

The term, respiratory quotient, is defined as the ratio between the volumes of carbon dioxide eliminated and of oxygen absorbed and its numerical values are used as an index to the kind of body material burned. The term, however, is very frequently applied to ratios obtained under conditions of experimenting when the primary object is to study the physiology of respiration rather than the catabolism of body material. Under such conditions, ratios are often obtained which are numerically well outside the commonly accepted range of respiratory quotients, *viz.*, 0.70 to 1.00. We would propose that the term, "*gaseous ratio*," be used when the investigators are interested purely in the physiology of respiration or when the workers believe that they are not warranted in attaching to the ratio obtained a significant value as an index to the catabolism. When, however, the conditions of experimenting are such that the respiration is perfectly natural or unhindered (as in a chamber) and the ratios are considered to give reliable information regarding the body substances catabolized, we would propose for use the term "*combustion index*." Good examples of experiments in

which these terms can be applied can be found in table VI. With H. O. the ratio of the carbon dioxide eliminated to oxygen absorbed varies from 0.67 to 1.03. That is, if we used the term "respiratory quotient" in its original sense as applying to this series, we would have a condition where at one period of the morning the subject was a severe diabetic (0.67) and in another period he was converting sugar into fat (1.03). It may even be questioned (as pointed out before) whether averaging all the ratios gives a true respiratory quotient. In this case we would be justified in using the term, "gaseous ratio," only. On the other hand, the series of ratios with T. H. N. varies from 0.79 to 0.81, a very narrow range. In this case we could apply the term, "combustion index" to any one of the ratios with a very great degree of certainty. We know of no systematic error or condition of experimenting which would cause us to believe these ratios, as a whole, are either too high or too low; any one of them is well within the experimental accuracy possible in the determination of the "combustion index." With most respiratory exchange apparatus the measurement of carbon dioxide eliminated is easy and that of oxygen consumed is difficult, regardless of whether the apparatus used is a breathing-appliance apparatus or a chamber apparatus; but the elimination of carbon dioxide is more easily affected than the consumption of oxygen by the type of breathing appliance or respiration apparatus employed.

We have shown in table VI the apparent changes in the respiratory quotient with the respiratory-valve apparatus, which we believe to be the best for measuring the respiratory quotient, regardless of breathing appliance used. As we have seen, the values in this table give no indication of vital change in the respiratory quotient (*i.e.*, "combustion index"). Consequently, we must conclude that from the standpoint of relative proportions of fat, carbohydrate, and protein alone, we have no reason to expect a significant change in the values for oxygen consumption, because the subjects were under the same conditions of experimenting, the sequence of periods from day to day was such as to eliminate the effect of apparatus, and the number of individuals studied was sufficiently large (17) to eliminate possible idiosyncrasies.

The periodic changes in the oxygen consumption between the hours of 8.30 A.M. and 12.30 P.M. are shown in table VII. This table is made up primarily from the standpoint that the apparatus or breathing appliance used has no significance in the results. Consequently, the values are arranged solely with reference to the sequence of the measurements themselves. We have included all the values obtained unless there was some reason for exclusion, due to faulty technique. The variations in the values from period to period and in the extremes are the results of possible inaccuracies in observation, unnoticed technical errors, and

TABLE VII. RESULTS OF MEASUREMENTS OF OXYGEN ABSORPTION ARRANGED SERIALLY IN RESPECT TO TIME AND WITHOUT REGARD TO BREATHING APPLIANCE OR RESPIRATION APPARATUS.

		(c. c. per minute)												DIFFERENCE BETWEEN EXTREMES	
		ORDER OF PERIODS IN RESPECT TO TIME OF DAY													
DATE	SUBJECT	1	2	3	4	5	6	7	8	9	10	11	12		
1918															
Apr. 8	J. A. C.	232	245	245	236	236	250	240	251	245	248	258	255	26	
" 9	C. A. C.	244	229	240	239	237	221	260	244	252	246	239	240	39	
" 10	H. H. H.	260	262	253	253	261	250	244	256	252	258	261	255	18	
" 11	T. H. N.	281	272	276	257	277	265	280	264	280	270	276	268	24	
" 12	J. F. T.	253	251	250	(261)*	242	251	247	265	261	261	262	256	23	
" 15	A. G. N.	258	238	245	243	227	227	247	236	249	221	228	218	40	
" 16	L. L. G.	240	238	231	265	225	223	234	226	225	230	226	237	35	
" 17	F. S.	221	266	206	211	221	219	219	212	222	219	223	230	24	
" 18	W. F. M.	274	261	236	260	264	248	263	263	234	269	311	274	77	
" 23	S. N. G.	269	266	274	265	267	257	269	257	270	253	273	262	21	
" 25	W. J. S.	191	199	192	192	201	206	197	199	193	200	183	213	30	
" 26	C. S. B.	217	221	229	224	225	229	(217)*	220	228	226	226	224	78	
" 30	H. O.	255	238	225	228	222	227	231	235	230	235	215	226	40	
May 1	P. G. H.	228	218	220	227	220	224	212	212	211	216	207	214	21	
" 2	C. F. M.	195	181	(196)*	182	181	178	179	176	196	185	190	181	20	
" 3	R. K. B.	247	248	248	241	244	241	234	239	244	240	251	261	27	
" 6	H. B.	219	214	210	208	216	217	220	214	212	209	218	217	12	
Average		240	234	234	231	233	233	235	238	236	239	238	237	33	

\* As explained in the text, the values in parentheses have been supplied to make the averages strictly comparable.

differences in actual level of oxygen consumption due to slight changes in wakefulness, degree of tone, and attention on the part of the subjects themselves. When it has been deemed necessary to omit the value found, because we believed the technique was faulty, we have inserted a value in parentheses which is the same as that in the period earlier or later with the same respiration apparatus and breathing appliance. This was done to make the averages strictly comparable.

To determine the general trend in the values for the oxygen consumption (which is the special purpose of this table), we may either consider the average values, or the values obtained with the subjects individually with respect to trend and extremes. If we first examine the average oxygen consumption to note the general trend, we find that the highest value (240 c.e.) is found in the first period. This would be expected, as experience has shown this to be always the case, irrespective of training. The averages then fall until the fourth period (approximately 9.50 A.M.), when the minimum is reached (231 c.e.). The actual range in values is therefore 9 c.e. Considering the lack of training of our subjects and technical difficulties of the apparatus used (two different types of respiration apparatus and three different breathing appliances), the range in the average oxygen consumption of 17 men is very small, and not very significant. After the fourth period, the average oxygen consumption rises slightly, remains more or less constant for four periods, then rises again until in the last three periods the values almost equal that found for the first period. The significance of this course is of value. The first period on the average is higher than any other, the middle four periods (the fifth to the eighth) are, on the average, the lowest: the second and third periods agree with this average, and the last four periods are somewhat higher on the average individually than the middle four, or, indeed, the second and third of the series.

Considering the individual series, particularly in reference to the ranges and the possible explanation of them, we find that differences between the extremes for any morning (see last column) vary from 78 c.e. per minute with C. S. B. on April 26 to 12 c.e. with H. B. on May 6. The next highest difference is 77 c.e. with W. F. M., April 18, the indi-

vidual values ranging from 234 to 311 c.e. Singularly both the highest and lowest values were obtained with the respiratory-valve apparatus. The lower is duplicated by another measurement with the same apparatus and breathing appliance. The highest value was found with a breathing appliance with which it is quite easy to detect a leak when it is used in combination with the respiratory-valve apparatus. Yet our examination of all the results and possible safeguards leads us to the conclusion that we cannot discard any of these values. Our personal observation was that this subject was not entirely cooperative. If we were inclined to accommodate all of our figures to what we believe, we should say that the ventilation figures for the third, ninth, and eleventh periods were wrong, but we have no proof. We wish to point out here that both the pulse and respiration rate indicated a constant metabolism. While the difference between the extremes was the largest for C. S. B., this is due to the high value of 295 c.e. obtained in the tenth period, his range for all other values being from 229 c.e. to 217 c.e., really a narrow range, all things considered. The high value of 295 c.e. occurred in a measurement with the respiratory-valve apparatus. An examination of the figures shows that this value is due solely to the total ventilation per minute, and to no other factor. The ventilation per minute may be in error due to an erroneous reading of the total ventilation, an erroneous reading of the stopwatch, an erroneous action of the stopwatch, or an actual physiological difference. There is no indication of difference in value of pulse rate; consequently, we must conclude there is an undiscovered error in total ventilation or the reading of the stopwatch.

The third highest difference was 40 c.e. per minute with A. G. N. and H. O. Both these differences are due primarily to the high values obtained in the first period, especially with H. O. The marked drop from a difference in extremes from 77 c.e. to 40 c.e. should be noted.

The next range is 39 c.e., C. A. C., which is due to the low and high figures occurring in the sixth and seventh periods, respectively. It would be tedious to discuss the rest of the values in detail. The ranges vary from 12 to 78 c.e., the modal value is 24 c.e. and the mean is 33 c.e. The mean is raised considerably

by the inclusion of the ranges of 78 and 71 c.c.

Our conclusion must be that irrespective of respiration apparatus or breathing appliance used, the oxygen consumption is fairly uniform and constant during the period from 8.30 A.M. to 12.30 P.M., with a subject at rest in the post-absorptive condition, and that such abnormal values as may occur in the actual measurements are due to slight variations in metabolism or to uncontrolled errors in technique or to errors on the part of the observer.

(To be concluded.)

### American Medical Biographies.

LUSK, WILLIAM THOMPSON (1838-1897).\*

William Thompson Lusk was born May 23, 1838, in the town of Norwich, Connecticut, and died in New York on June 12, 1897, and was the son of Sylvester Graham and Elizabeth Freeman (Adams) Lusk, and the great-great-grandson of John Lusk, who, emigrating from Scotland, died at Wethersfield, Connecticut, in 1788.

He was educated at the best schools and remembered especially the admonition of the Head Master at Russell's Military School in New Haven in 1854-55, given to some late comers from the Southern States, "Boys, I suppose I must accept these excuses from your parents, but when you pass from here into the outside world you will find that excuses do not count."

Entering Yale in 1855, he was the roommate of his life long friend, William Walter Phelps, and the two strove for high honors in the class. He had difficulty with his eyes and left college after a year. A strict training in the classics gave him the mental excellency of the old-fashioned scholarship, a scholarship evidenced in all his writings. Shortly after leaving college he went abroad and studied medicine during two years in Heidelberg and in Berlin, anticipating the receipt of a degree from Berlin at the end of a third year. The outbreak of the Civil War, however, led him to return to America where he enlisted in the army in time to participate in the battle of Blackburn's Ford. He was also engaged in the battles of First Bull Run, Port Royal, Secessionville on James Island, Second Bull Run, Chantilly, South Mountain, Antie-

tam, Fredericksburg and many minor engagements. In the single battle of Secessionville on James Island his regiment, the Seventy-ninth Highlanders of New York, lost 110 out of 484 men. In this battle he acted as aide to General Isaac I. Stevens, who officially reported that he "was in all parts of the field, carrying my orders and bringing me information to the great exposure of his life."

In 1863 he resumed his medical studies in the newly organized Bellevue Medical College and graduated the valedictorian of his class. After graduation he married Mary Hartwell Chittenden, daughter of S. B. Chittenden, a New York merchant, and then spent two years of study in Paris, Vienna, and Edinburgh. These years of foreign study gave him a mastery of medicine from the world viewpoint. Returning to America, he settled in New York in 1866 and taught physiology at the Long Island Hospital Medical College in Brooklyn. In 1870-71, on an invitation extended by Oliver Wendell Holmes, he lectured on physiology at the Harvard Medical School. Bowditch returned to Boston about this time and a hesitancy on the part of the Harvard authorities regarding the appointment to the chair of physiology led Dr. Lusk to make an arrangement to become the associate of Fordyce Barker, then a leading obstetrician in New York, and to accept the chair of Obstetrics and Diseases of Women and Children in the Bellevue Hospital Medical College, a position which he held until his death. The professorship of physiology at Harvard was offered to him the day after he had completed these arrangements. By this contingency New York instead of Boston became his place of residence. He always stated that this experience was illustrative of a man's fate being outside his choice and of success being dependent upon an ability to do well whatever offered in life.

While teaching physiology he engaged in research work concerning the nature of the glyco-genic function of the liver. His book, the "Science and Art of Midwifery," was issued in its first edition in 1882. It passed through four editions and was translated into French, Italian, Spanish and, by order of the British authorities in Egypt, into Arabic. Playfair acknowledged it as the only rival to his own book on obstetrics. Dr. Lusk attributed its success to the fact that for the first time in a textbook printed in the English language the attempt was made to explain the phenomena of

\* From the forthcoming "American Medical Biography," by Dr. Howel A. Kelly and Dr. Walter L. Burgeon. Any important addition or corrections will be welcomed by the author.



gestation and labor in accordance with physiological laws. Before the book was issued Dr. Barker caused the publishers anxiety by stating to them his belief that it was too ambitious an undertaking for so young a man. This is only a characteristic judgment of an older generation upon a younger one. Dr. Lusk was an inveterate reader and maintained a knowledge of the medical advances throughout the world. Thus, after reading of the successful mode of operation of Sanger, he performed in 1887 the second successful operation of Caesarean section in New York City, saving the lives of both mother and child, the first having been done in the year 1838.

Yale University gave him the degree of LL. D.; he was president of the American Gynecological Society; vice-president of the New York Academy of Medicine; honorary fellow of the obstetrical societies of London and of Edinburgh; fellow of the Paris Academy of Medicine; and corresponding fellow of the obstetrical societies of Paris and of Leipzig.

In a memorial address given before the New York County Medical Association shortly after his death in 1897, Dr. Austin Flint (the physiologist) said: "No eulogy of mine can add to the nobly earned and well deserved reputation of Dr. Lusk; but I esteem it a precious privilege to pay this tribute to his memory, which lives in the hearts of his thousands of pupils and tens of thousands of readers. He was a true and reliable friend and had no enmities, a most accomplished physician, an original thinker and observer, a laborious and successful investigator, and a gentleman in the highest sense of the word."

Five children were born after his first marriage, of whom survived Graham Lusk, professor of physiology at the Cornell Medical College; Mary E. Lusk (Mrs. Cleveland Moffett); William C. Lusk, professor of clinical surgery at the University and Bellevue Hospital Medical School; and Anna H. Lusk. In 1876 he married Mrs. Matilda Thorn and a daughter by this marriage, Alice Lusk, married J. Clarence Webster, professor of obstetrics and gynecology at the University of Chicago.

GRAHAM LUSK, M.D.

#### BIBLIOGRAPHY.

"War Letters" of William Thompson Lusk, New York. Privately printed, 1909. This includes the memorial address, and has been placed in the larger libraries of the country.

### Book Review.

*Concerning Some Headaches and Eye Disorders of Nasal Origin.* By GREENFIELD SLUDER, M.D., Clinical Professor and Director of the Department of Laryngology and Rhinology, Washington University Medical School, St. Louis. 272 Pages and 115 Illustrations. St. Louis: C. V. Mosby Company, 1918.

The subject of headaches is important and involved: therefore the experience in diagnosis and treatment of so good an authority on the correlation between nose, eyes, and nerves cannot be disregarded by the workers in any of these fields. Three pathological and clinical pictures are described in detail: closure of the frontal sinuses without suppuration, the syndrome of neuroses of the sphenopalatine ganglion, and the picture of hyperplastic sphenoiditis. Although these are only three of the conditions in which the focus of trouble in the eye or nerves is to be found in the nose, they are less obvious to inspection than most of the others.

The author believes that in the majority of cases commonly classed as acute frontal sinusitis, without visible secretion, the pain and tenderness are the result of a negative pressure in the sinus, due to obstruction in the duct, and absorption of air. The different conditions are described under which this obstruction may occur.

The author's work on the sphenopalatine ganglion is widely known. The subject is complicated. Though others have sometimes failed to follow his methods, or to get his results, these must be studied by all who hope to be expert in intra-nasal neuroses.

Hyperplastic sphenoiditis means a pathological process of the mucous membrane, but often also of the bone. These bone changes are described and illustrated in a separate chapter by Jonathan Wright. They may persist after all local evidence of suppuration, if it was ever present, has disappeared. Sluder finds that this lesion underlies many of the recurrent headaches in healthy people, which at present bear the name "migraine."

The anatomy of these regions is carefully shown, and the author's methods of operating upon the different accessory sinuses, and a considerable number of clinical cases are given. The book does not attempt to cover the subject of obviously suppurating disease of the accessory sinuses, but the anatomical and clinical relations of these cavities with the brain and neighboring nerves are incidentally brought out. It is a carefully prepared and scholarly treatise.

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## REVIEW OF THE INFLUENZA EPIDEMIC.

THE American Public Health Association, at its convention held in Chicago, outlined various phases of the epidemic of influenza in the United States. The discussion is reviewed in a recent issue of *The Commonwealth*. It was estimated that there were approximately 10,000,000 cases and 400,000 deaths from this disease in the United States during the months of September, October, and November, 1918. The opinion was expressed by the majority that the micro-organism, or virus causative, of the disease was undetermined; but that the superimposed infections were caused by several known organisms, which were responsible for the fatal terminations. As the etiology of influenza is not yet determined, the mode or modes of transmission cannot be positively stated; but it was pointed out that since the disease attacks principally the respiratory tract, it is probable that the infective micro-organism

or virus is contained in the secretions and discharges of this tract, thus making it appear that droplet infection must be considered one of the principal modes of transmission of the disease.

The conclusions drawn from the discussion of the efficacy of vaccines for prophylactic and therapeutic use are of considerable interest. Vaccines made from the bacillus of Pfeiffer were considered unsuccessful; vaccines from stock cultures of one or more organisms were reported as of no value. It was thought that a vaccine made from organisms freshly isolated from the sputum and lungs, and incorporated in about the proportion as found might be of value in preventing the complicating influenzal pneumonias; but it was generally believed that no vaccine has yet been found to possess therapeutic properties or value.

In considering the prevention and control of influenza, varied opinions expressed by health officers from different sections of the country showed that while their problems were similar, yet the disease did not affect any two sections in exactly the same way. Although there could be formulated no definite measures of control which would be applicable to all communities, it was agreed that the measures best adapted to aid in the control of influenza are compulsory reporting of cases of patients ill with influenza, isolation of patients and quarantine if necessary, disinfection of discharges from the nose and throat, wearing of masks by attendants in the sick room, care of the hands of patients, care of food utensils, general closing of crowded gathering places, education, and publicity.

By discussing the etiology, modes of transmission, the use of biological agents for prophylactic and therapeutic purposes, and measures for control, the American Public Health Association has endeavored to determine a uniform standard of control to aid local health authorities in combating future outbreaks of influenza.

## HIGHLANDS AND ISLANDS MEDICAL SERVICE BOARD.

IN a summary of the fifth annual report for the year 1918 of the Highlands and Islands Medical Service Board in *The British Medical Journal*, interesting information is presented

concerning difficulties which have confronted the medical profession and means which have been adopted in an attempt to solve them. It is stated that the number of medical practitioners and nurses continued to decrease during 1918, and that there was no appreciable relief through demobilization before the end of the year. In these districts, as everywhere, influenza added to the work already heavy because of war conditions, and doctors and nurses who remained at home and escaped influenza conducted their work under most trying difficulties.

It is interesting to learn the practical results of a scheme which has been in operation for three years throughout the Highlands and Islands, with the exception of a few parishes. A plan whereby medical service at moderate fees may be available to certain classes has been worked out, with apparently gratifying results. It has been arranged so that the fee paid by the patient shall be the same, regardless of the distance from the doctor's place of residence. In this way, adequate medical service is within the reach of persons of limited means and a reasonable remuneration is assured the physician. The statistics for 1917-1918 show that the people are taking advantage of the opportunity thus afforded them. An increase of 6.6 per cent. in the number of miles per practice travelled, and an increase of 20.8 per cent. in the number of visits has been recorded. There has been an increase of over four per cent. in travelling and visits to patients coming within the range of this new arrangement made by the Board, and a corresponding decrease in purely private patients. Probably eighty per cent. of the travelling and seventy-five per cent. of the visits are under the auspices of some form of public service. The figures for the last two years indicate that the work applicable to what may be described as "appointments" is increasing, and that there is no corresponding increase in purely private practice.

The Highlands and Islands Medical Service Board believes that the nursing service should be so organized on a county district that there can be provided a sufficient number of qualified nurses to assist in public welfare undertakings as well as in general nursing work. Grants are made by the Board to thirty-eight nursing associations, and other grants are also made toward the maintenance of hospitals.

The efforts of the Highlands and Islands Medical Service Board have been directed toward the organization of the medical service on a basis equitable both to the patients and to the practitioners, and although the present system may need to be modified somewhat in the future, its principles appear to be worthy, and acceptable both to the communities and to the profession.

#### FIFTIETH ANNIVERSARY OF MASSACHUSETTS STATE BOARD OF HEALTH.

DR. EUGENE R. KELLEY, State Commissioner of Health, wishes to extend to all members of the Massachusetts Medical Society a cordial invitation to attend the exercises to be held in the House Chamber of the State House, Monday, September 15, 1919, at three o'clock, in observance of the fiftieth anniversary of the founding of the Massachusetts State Board of Health. An address of welcome will be made by Hon. Calvin Coolidge, Governor of Massachusetts. Other addresses will be given by Dr. Henry P. Walcott, formerly chairman of the Massachusetts State Board of Health; Sir Arthur Newsholme, former chief medical officer of the Local Government Board of England; Assistant Surgeon General Allan J. McLaughlin, of the United States Public Health Service; and Dr. William H. Welch, Director, School of Hygiene and Public Health, Johns Hopkins University.

A short reception will follow the speaking.

#### MEDICAL NOTES.

MEDICAL CONDITIONS IN LUXEMBURG.—An account of the medical conditions of the Grand Duchy of Luxembourg has been published in the *Paris Médical* and reviewed in a recent issue of *The British Medical Journal*. It states that the total population is about 267,500, and that the number of medical practitioners is 123. There are 34 physicians at the capital, which has a population of 20,000. There is an excellent laboratory of bacteriology under the direction of Dr. Auguste Praum, who is also president of the Société des Sciences Médicales. At present there is no higher teaching in the Grand Duchy, and a State diploma granted after examination by a medical commission is all that is needed for the legal practice of medicine.

**THE CORRECTION OF SPEECH DISORDERS.**—We have recently received at the office a list of one hundred and twenty papers on "The Correction of Speech Disorders," read in Cleveland, Ohio, to the part-time speech teachers during their first year of medical supervision, by Walter B. Swift, M.D., expert advisor for speech defects to the Division of Medical Inspection and Physical Education of the Cleveland Public Schools. These papers were read at the meetings of The National Society for the Study and Correction of Speech Disorders between June, 1918, and June, 1919. Ninety-one of these articles were contributed by Dr. Swift.

This series of papers makes a notable contribution to the literature of speech correction. They cover a wide range of subjects and are arranged progressively, containing a part of the formal instruction given to part-time speech teachers during their first year of work. The City of Cleveland has probably done more than any other city in America in the installation of modern methods of speech correction. Reprints of any of these papers, when published, will be sent upon request, free of charge, to anyone applying to Dr. W. B. Swift, 110 Bay State Road, Boston.

**INFLUENZA INVESTIGATION.**—We have received recently from the American Medical Association the following questions and answers about influenza, and the resolutions passed at the recent meeting of the Association asking for a government appropriation of \$1,500,000 to be used for the purpose of carrying on an investigation of influenza, its cause, prevention and treatment:

*Q.* Will the epidemic again appear?

*A.* The epidemic will recur, for medical history shows that we have had a series of influenza or gripe epidemics, the last of which proved to be of the most virulent type. There immediately occur to me those of 1867 and of 1889 to 1895. The Metropolitan Life has issued some very definite figures on this latter epidemic covering millions of policy holders, which show an average increased mortality for the five years following of 40% above the normal death rate. Any estimate of economic loss should include the 40% increased mortality that, in all likelihood, will similarly occur in the next four or five years.

*Q.* Is its origin fairly well known? If not, the likelihood of definite information by research

*A.* Much private research has been carried on, but its origin and spread is still undetermined. This must be collected and further stimulated, for only through careful research is there any likelihood of definite information.

*Q.* What success in the discovery of an antitoxin?

*A.* The possibility of the discovery of a real antitoxin for influenza is wholly dependent upon the discovery of the actual germ causing the disease.

*Q.* The possibility of collecting necessary information and its distribution among the people to reduce the dangers of its spread and increase the chances of recovery?

*A.* I need but cite two of many similar researches, successfully undertaken, that have practically eliminated the dangers of the spread of the disease, to wit, malaria and typhoid. Except for our knowledge of typhoid, the armies of Europe would have been decimated by this disease alone.

*Q.* The generally bad after effects of the disease?

*A.* The generally bad after effects of the disease are, unfortunately, too well known by the profession. The Red Cross Chapter in Cincinnati is expending perhaps \$200,000 in an effort to examine physically every person who has suffered with influenza: to discover the pathological conditions—bad heart bad kidneys and lungs—resulting from this epidemic, and relieving the poverty and chronic invalidism that accompany it.

*Q.* The economic loss to the country of the epidemic?

*A.* The economic loss can hardly be estimated. The 500,000 deaths alone represent \$2,500,000,000 economic loss. Economists all agree to the fact that \$5,000 is the minimum social and economic value of a human life. It is safe to say that 10,000,000 people had the disease and that they lost 150,000,000 working days. At a minimum combined loss of wage and production of \$7.00 per day, there has been another \$1,000,000,000 of economic loss to the country. In other words, conservatively speaking, we had between \$3,000,000,000 and \$4,000,000,000 loss in this last epidemic.

*Whereas*, the present influenza epidemic caused approximately 500,000 deaths in the United States, and

*Whereas*, a large proportion of these deaths, were produced by pneumonia and other complications, and

*Whereas*, influenza, pneumonia, and allied diseases now cause approximately one-tenth of all the deaths in the United States, and

Whereas, medical science is not yet in possession of complete data as to the cause, modes of transmission, prevention, and cure of this disease and its complications, and

Whereas, the possession of this knowledge is of grave social and economic concern to the nation:

Therefore Be It Resolved, that it is the sense of the members of the section on industrial medicine and surgery of the American Medical Association, here assembled to discuss influenza, that Congress should and is hereby urged to appropriate not less than \$1,500,000 to be used under the direction of the United States Public Health Service for the investigation of the causes, modes of transmission, prevention and cure of influenza, pneumonia, and allied diseases, this sum to be made available to July 1, 1922.

Transmitted by order of the session, held in Atlantic City, June 13, 1919.

DR. ORTO P. GEIER, *Secretary*,  
Cincinnati Milling Machine Co.,  
Cincinnati, Ohio.

GIFT OF ABYSSINIAN MISSION.—The Abyssinian Mission, which arrived in this country recently, has given to the American Red Cross a gift of about \$5,000 to be devoted to humanitarian enterprises. This gift is an indication of the faith which this ancient African kingdom has in the future of the Red Cross, its work and purpose.

POSTURE AND ITS RELATION TO HEALTH.—In a recent issue of *The Commonwealth* there is an article discussing the relation between posture and health. Posture involves the position of the feet, the trunk, and the head. The feet should be parallel to each other and the weight borne largely on the outer strong side of the foot. When sitting, children and adults should sit on the back of the thighs and on the bones of the pelvis, not on the small of the back. When standing and walking, besides keeping the feet parallel, the legs should be straight, the abdomen slightly retracted, the shoulders dropped and held back, and the head balanced. Attention to these simple suggestions outlining the proper pose and poise promotes good health by making possible deep respiration and good circulation, and by diminishing fatigue.

ARMY GENERAL HOSPITALS.—On September 30, the following six army general hospitals

will be closed: The hospitals located at Ontario, N. Y.; Biltmore, N. C.; New Haven, Ct.; Fort Benjamin Harrison, Ind.; Fort Douglas, Utah; and Fort Snelling, Minn.

TYPHUS IN POLAND AND RUSSIAN BALTIC STATES.—A recent report states that there are 170,000 cases of typhus in Poland and in the Baltic Russian states at the present time. A group of five hundred Americans, under the leadership of Colonel Harry L. Gilechrist of the Medical Corps, U. S. A., is hastening through Germany to give relief to the afflicted districts. Germany is furnishing whatever delousing equipment is available and is coöperating in transporting medical supplies. At the suggestion of the Polish Government, ten thousand pairs of hair clippers are included in the equipment. The supplies which are being sent to the aid of the suffering countries fill nearly eight hundred freight cars.

RED CROSS ANTI-TYPHUS WORK.—The anti-typhus work which has been accomplished by the American Red Cross has been reviewed in a report issued by the New England Division of the American Red Cross. The anti-typhus train, which was constructed by the Red Cross for the Allies in 1918, has travelled more than four thousand miles across Siberia, and is now at Perm fighting an outbreak of typhus among the soldiers and civilians there. The train was originally intended to be used in the maritime provinces of Siberia, but when the epidemic began to spread throughout the country it went toward the west, carrying sanitary and medical supplies for the suffering men, women, and children. The fever spread like among military camps, prisons, barracks, hospitals, orphanages, and refugee colonies. Tens of thousands of hospital cases were reported.

In February, 1919, the train left Vladivostok, and continued its work in spite of the fact that typhus broke out among the attendants. Hundreds of patients were bathed daily, their clothes were sterilized, and they were given medicine and garments. The work extended from Vladivostok on the east to Chelyabinsk on the west, a distance of 4125 miles. About 20,000 cases have been treated by the expedition in the six months that the train has been fighting the disease. On one day, 999 patients were cared for. Considerable data has been collected which will be valuable in future anti-typhus campaigns. The health conditions

of the various districts have been studied, and every effort made to supply the needs of the inhabitants. It was discovered that many towns had insufficient sterilizing facilities: to meet this situation, the Red Cross is making plans to construct two hundred sterilizers of a Russian type for distribution among the people next winter, when it is probable that there may be a recurrence of the epidemic. Both the civilian population and the Russian Army face a shortage of clothing, a situation which makes adequate disinfection impossible. Although the Red Cross is sending trainloads of relief goods into the country, the supply is inadequate to meet the needs of the people.

**BRITISH MEDICAL RESEARCH.**—At the third reading of the "Dogs' Protection" Bill in the House of Commons it was proposed that the House decline to proceed further with the measure, on the ground that it would hinder unnecessarily the progress of medical research. *The British Medical Journal* has reported that it was pointed out by Sir Watson Cheyne that the amendment which has been considered, although recognized to be of value, would still impose an unjust censure on the medical profession and cause delay. As an example of the protection afforded human beings by experiments upon dogs, he quoted the experiments with gas made during the war on dogs and goats. After discussion, both in favor of and against the bill, it was defeated by a vote of 101 to 62.

**QUALITY OF PEPTONE.**—It has been reported that a representative of the Research Laboratories of the Royal Institute of Public Health in England, in commenting upon bacteriological testing, pointed out the disadvantages of not paying sufficient attention to the manufacture of such products as peptone. In American products it is admitted that the quality and standard cannot be guaranteed. Peptones are made from cattle not carefully enough selected and without consideration for Rideal-Walker test requirements. It has been noticed particularly since the cessation of the supply from Germany, that if used for a cultural medium, this product has resulted in varied cultural features and no standard quality can be depended on.

**DR. SIMON FLEXNER.**—At a meeting of the Royal Society of London, held on June 26,

Dr. Simon Flexner, of the Rockefeller Institute for Medical Research, was elected a Fellow.

**RHYTHM IN INDUSTRY.**—In an article in a recent Public Health report it is stated that rhythm in industry and occupational fatigue tend to relieve attention and its consequent fatigue, to render more uniform the metabolism and recovery involved in the operation by evenly distributing the work, to mask fatigue effects, and to increase or decrease accident hazard according to the type of accident causation.

**BUFFALO DEPARTMENT OF HEALTH.**—The annual report of the Department of Health of Buffalo records a total membership of 299. Except for the influenza epidemic, the record for communicable diseases has been a good one, with 37 deaths from typhoid fever, 18 from scarlet fever, 112 from diphtheria, 60 from whooping cough, and 44 from measles. Efforts have been made to reduce all preventable infant mortality and \$15,000 was appropriated for this work; but the influenza epidemic prevented the carrying out of the proposed plans. The health service of Buffalo is carried on from pre-natal activities, through childhood, adult life, and old age, without interference with public hospitals and private physicians.

The Division of Tuberculosis has increased its many activities during the year. The work includes educational instruction, hospital, sanitarium, preventorium, and follow-up care, investigation and examination of suspected cases, supervision of home conditions, and investigation and following up of all returned soldiers and those reported by camps or draft boards as having tuberculosis or suspected tuberculosis.

Of equal importance have been the efforts made to control venereal diseases. Free laboratory service has been available for everybody, as well as hospital and dispensary treatment and social service. The health of school children has been safeguarded by the daily inspection of schools by medical school examiners and school nurses. The Bureau of Food Inspection has supervised the milk supply, restaurants, kitchens, and bakeries. In spite of added labor because of the war, the Health Department has been able to assist medical students and graduates in offering them the fa-

cilities of various clinics. Through the *Bulletin*, continuous health education propaganda has been carried on.

**THE AMERICAN JOURNAL OF PUBLIC HEALTH.**—The next annual meeting of the American Public Health Association is to be held at New Orleans, La., October 27-30, inclusive. The central themes of discussion will be Southern health problems, including malaria, typhoid fever, hookworm, soil pollution, and the privy.

The general belief among the health profession is that influenza will return next winter, and a full session will therefore be devoted to this subject for the purpose of developing methods of control.

A special effort has been made to arrange the program to meet the practical needs of health officials. Accordingly there will be discussion on such questions as the attitude of legislators towards public health, the obtaining of appropriations, cooperation from women's clubs, health organizations, and the organization of health centers.

The program of the sections will deal, as usual, with public health administration, vital statistics, sanitary engineering, laboratory methods, industrial hygiene, sociology, and food and drugs.

Two special programs will also be presented on various phases of child hygiene and personal hygiene.

The program of the meetings will be published in the *American Journal of Public Health* appearing October 5, or may at that time be had upon application to the Secretary, 169 Massachusetts Avenue, Boston, Massachusetts.

**PROPOSED BILL FOR NATIONAL DEPARTMENT OF HEALTH.**—There has been proposed recently Senate Bill 2,507, providing for the organization of a national department of health. The bill follows the general plan of the Owen Bill, with some modifications of importance. The *Journal of the American Medical Association* has summarized the provisions of this bill. It provides for a department of public health to be directed by a secretary, who shall be a member of the cabinet, and for three assistant secretaries. It proposes that a United States Public Health Service and the Bureau of Chemistry be transferred to the new department, which is also to include bureaus on vital

statistics, sanitation, hospitals, child and school hygiene, quarantine, food and drugs, nursing, tuberculosis, and personnel. It will be the duty of the secretary of public health to communicate with the governor of each state requesting him to recommend to the legislature suitable legislation with adequate appropriations to secure cooperation between the Federal Department of Public Health and the State Board of Health. The United States will be divided into health states conforming to the geographical boundaries of the various political divisions. Each state is to create a state board of health, with a state health officer for the state and for each district, subdivision, and precinct, to be appointed by the secretary of public health as federal health officers. The Department of Public Health is directed to cooperate with the Departments of Commerce, Labor, and the Interior in the collection of vital statistics and to establish a uniform system of cards, records, and reports regarding diseases, disabilities, industrial accidents, births, deaths, physical condition of school children, the number and condition of existing hospitals, etc. The bill provides for the appropriation of \$15,000,000 for 1920 to be prorated among the states in proportion to their population as soon as the states comply with the provisions of the law and the regulations of the secretary of public health, provided that each cooperating state must contribute to the public health work a sum equal to that contributed by the federal government and that it must make full and complete reports of births, deaths, and morbidity. It also appropriates \$48,000,000 for the construction of sanatoriums and hospitals, this sum to be distributed among the states in proportion to their population, each state receiving its allotment to provide an equal amount, also location, plans, and means of future support for the proposed hospital.

**MEDICINAL USE OF ALCOHOL.**—The following regulations governing the sale of alcohol for medicinal purposes, issued by the Bureau of Internal Revenue, may be of interest to physicians:

"Physicians may prescribe wines and liquors for internal uses, or alcohol for external uses, but in every such case each prescription shall be in duplicate and both copies be signed in the physician's handwriting. The quantity prescribed for a single patient at a given time

shall not exceed one quart. In no case shall a physician prescribe alcoholic liquors unless the patient is under his constant personal supervision.

"All prescriptions shall indicate clearly the name and address of the patient, including street and apartment number, if any, the date when written, the condition of illness for which prescribed, and the name of the pharmacist to whom the prescription is to be presented for filling."

**APPRECIATION OF SERVICES OF UNITED STATES MEDICAL CORPS.**—General Pershing has expressed his personal appreciation of the services rendered by the medical corps at the front and in the hospitals. He stated that their achievements have added new glory to their profession and that the fortitude with which they had suffered casualties and privations was beyond praise. A statement recently issued by the Surgeon-General records four hundred and forty-two casualties among the medical officers of the American Expeditionary Forces in France from July 1, 1917, to March 13, 1919.

**PROMOTIONS IN MEDICAL CORPS, U.S.N.R.F.**—The following promotions in the Medical Reserve Corps, United States Navy, have been announced. This is the first time in the history of the Navy that medical reserve officers have been ranked higher than Lieutenant-Commander:

Commander: William Seaman Bainbridge, Robert Crier LeConte, William Baret Brinsmade, Stanley Stillman, Eugene Floyd DuBois, Rea Smith, John Chalmers DaCosta, Milton Joseph Rosenau, George Gorgas Ross, Albion Walter Hewlett, Hobart Amory Hare, Robert Battey Greenough, Judson Daland, James Eli Talley, Edward Milton Foote, Paul Adin Lewis, Guy Cochran, Verne Adams Dodd, Edgerton Lafayette Crispin, John Aloysius McGlinn, LeRoy Goddard Crandon, Harold Denman Meeker, Nelson Henry Clark, Halsey DeWolf, Charles W. Moots, George Arnold Matteson, James Taylor Hanan, Francis Joseph Dever, Frank Consins Gregg, Clifford Elmore Henry, Porter Bruce Brockway, Clinton C. Tyrrell, Frederick Obadiah Williams, Harvey Mitchell Righter, Zachary Thomas Scott, William Curtis Newton, William Henry Areson.

## Correspondence.

### DISCHARGED TUBERCULOUS SOLDIERS.

Boston, Mass., Aug. 28, 1919.

Mr. Editor:—

I have read in the New England Notes, in the issue of the JOURNAL of August 28, 1919, a paragraph on the New England Sanatorium at Rutland. In this paragraph the following statement is made: "It has been estimated that of the discharged disabled soldiers and sailors, twenty-two per cent. are tuberculous." I do not doubt but that such an estimate has been made, but I very greatly doubt its truth. If it were stated that twenty-two per cent. of disabled soldiers and sailors were discharged as having tuberculosis, that would be an entirely different matter.

In my private practise and in my hospital clinic at the Massachusetts General Hospital, I have seen many soldiers and sailors discharged from the Army and Navy as having pulmonary tuberculosis and bearing the full weight of everything that this means. It has been my privilege in by far the greater number of cases to prove, to my own satisfaction at least, with the aid of the x-ray, and indeed, in many cases, to the satisfaction of the Army and Navy authorities, that either these men did not have pulmonary tuberculosis at all, or else that they did not have it in clinical form, and were in no need of sanatorium or institutional treatment. There are, of course, many soldiers and sailors whose previously quiescent tuberculosis has broken down under the strain of army and navy life, and for these, the New England Sanatorium at Rutland will be an ideal place.

I cannot, however, let the statement go without comment, that twenty-two per cent. of the discharged disabled soldiers and sailors are tuberculous.

Very truly yours,

JOHN B. HAWES, 20.

## Miscellany.

### RECENT DEATHS.

DR. MARY BLAIR MOODY died at her home in New Haven on August 18. Dr. Moody was the first woman to be graduated from the Buffalo Medical School. For many years she practised medicine and surgery in the State of New York, and contributed a number of articles to medical literature. She died at the age of eighty-two years.

DR. HENRY ZIMMERMAN, of Springfield, was shot and killed August 7, 1919. He was a graduate of the University of Maryland School of Medicine, in 1912, joined the Massachusetts Medical Society in 1913, and settled in Springfield. He had returned recently from service in the Medical Corps of the United States Army.

DR. ALBERT LANE NORRIS, a retired Fellow of the Massachusetts Medical Society, died at Brookline, August 29, 1919, aged 80. He was a native of Epping, N. H., served in the Civil War as Acting Assistant Surgeon, settled in East Cambridge, and later moved to Malden, where he spent his life in practice. He wrote several papers on gynecological topics for medical journals and was president of the Middlesex South District Medical Society in 1878.

DR. EDWARD R. SISSEX died at his home in New Bedford on August 27 at the age of ninety-one years. He was born in Westport. He graduated from Jefferson College, Philadelphia, and studied medicine at the Berkshire Medical College in Pittsfield, graduating in 1853. The following year he received a degree from the College of Physicians and Surgeons, New York.



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## Original Articles.

### THE ADMINISTRATION OF ARSPHENAMINE.

By ALBERT S. HYMAN, M.D., BOSTON,

Assistant Resident Physician, Long Island Hospital,  
[From the Venereal Service of the Long Island Hospital.]

THE increasing use of arspenamine in the treatment of the spirochetotic diseases is filling medical literature with reports of many grave<sup>1</sup> and occasionally fatal<sup>2</sup> sequelae associated with or directly following the administration of this drug. These reports have been issued with such an alarming frequency that it is not without a growing apprehension that the conscientious practitioner continues to use one or another of the various preparations that are dispensed under the name "arsphenamine."

The condition is apparently much the same in all of the scientifically active countries. Attempts at standardization of the process and inquiries into the nature of the reactions following the use of arspenamine have been made by able investigators of many lands. From Paris comes the recent study of the eminent French syphilologist, Dr. G. Milian.<sup>3</sup> Even the Germans, though they possess the original salvarsan process, are not without their diffi-

culties. In October of 1918, Professor Hoffman, the successor of Paul Ehrlich, was selected by the *Allgemeine ärztliche Verein*<sup>4</sup> to study the untoward effects of the drug.

In this country, the U. S. Army Medical Department with its enormous clinical opportunities and demands soon felt the need of a standardized process. Accordingly, there was issued from the office of the Surgeon-General a manual for the treatment of venereal diseases.<sup>5</sup> Apparently this compendium failed in some of its promises, for a little later there appeared a supplement<sup>6</sup> which modified at some length the procedure of the former.

With the cessation of war activities, the arspenamine problem was naturally taken over by the Public Health Service, and only recently McCoy<sup>7</sup> has issued a circular describing the standardized process of this department; McCoy's statements<sup>8</sup> have been too emphatic to meet with the unanimous approval of the clinicians<sup>9</sup> using the drug.

The arspenamine problem is thus far from being solved and the practitioner views with confusion the multitude of "standardized processes" and the diversity of opinion held by the investigators of this specific drug.

In brief, the arspenamine problem, so called, is concerned with the reactions following the use of this drug and the proper method of ad-

ministering it in order to reduce or, if possible, to eliminate these reactions.

In an analytical review of 500 doses of arsphenamine given at the Long Island Hospital, we have been able to obtain what we believe are impressive clinical data in regard to the disagreeable complications following the intravenous administration of the drug. The attempt to classify these complications is perhaps not without value, for in so doing we may appreciate more readily the lines of prophylaxis and treatment to be followed.

The French investigators<sup>3</sup> describe two types of reaction—an inconstant "nitritoid" reaction, which is closely allied to anaphylactic phenomena following the introduction of a foreign protein into the body and an intolerant arsenic reaction. In this country, Sargent<sup>10</sup> has defined two reaction groups which he calls "vasoparalytic" and "gastro-intestinal." Finally, Beechson<sup>11</sup> describes another type of the nitritoid reaction, which he believes is due to suprarenal insufficiency.

In our 500 doses we have seen 58 reactions, or a general average of about 11.6% (see table I). In analyzing each group of 100 doses, we have had 21% reactions in the first 100; 15% in the second; 11% in the third; 6% in the fourth; and 5% in the fifth. This remarkable decrease in the percentage of reactions we believe to be due to the application of principles developed from an intensive study of the reactions occurring in the first 100 doses.

We have found it convenient to divide the reactions into four general clinical groups, depending in some part upon the time of their manifestation after the reception of the drug.

The first group shows an immediate reaction to the intravenous injection of the solution and is indicated by an increasing congestion of the blood vessels of the face and neck. The patient becomes cyanotic and complains bitterly of a peculiar, oppressive sensation in the chest, particularly under the sternum. The congestion is sometimes tremendous and startling; the dyspnea increases; and the patient cries out as though in agonizing fear. In a few minutes, however, the congestion gradually subsides, the respirations are easier, and the patient is apparently none the worse for his "ordeal," and indeed it is, for usually the patient will refuse subsequent intravenous treatments because of their apprehensive character.

This immediate type of reaction occurred in about 1% of our cases (see table I); the patients were men and women of the so-called

TABLE I. SHOWING THE NUMBER AND PERCENTAGE OF REACTIONS IN EACH CLASS OCCURRING IN FIVE SERIES OF CASES, EACH CONTAINING 100 DOSES OF ARSPHENAMINE.

SERIES	CLASS I		CLASS II		CLASS III		CLASS IV		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%
100	4	0.8	15	3.0	2	0.4	0	0	21	4.2
200	2	0.4	11	2.2	1	0.2	1	0.2	15	3.0
300	0	0	11	2.2	0	0	0	0	11	2.2
400	0	0	6	1.2	0	0	0	0	6	1.2
500	0	0	5	1.0	0	0	0	0	5	1.0
Total	6	1.2	48	9.6	3	0.6	1	0.2	58	11.6

"plethoric disposition" type and for this reason we believe that most, but not all, of their symptoms were due to the physiological effect produced by increasing the fluid circulating medium in a system already carrying an excess burden. That this is actually the case we were able to demonstrate in the following way. Patients who were known to react in this immediate fashion were given 200 c.c. of normal salt solution intravenously. In order to eliminate psychical influences so far as possible, the salt solution was given by the same apparatus and under exactly the same conditions as their previous dose of arsphenamine. All of the patients reacted to this increase in the circulating medium but showed symptoms to a somewhat lesser degree than when arsphenamine was used. Injection of arsphenamine on a subsequent day would cause the violent symptoms already described.

We have concluded from these facts that the immediate reaction to arsphenamine when injected intravenously is due for most part to the physiological response of the circulating system to an increase in its fluid content. The additional factor is the effect of arsphenamine itself, and this we believe is directly dependent upon its method of preparation, later to be described.

If this immediate reaction is merely a mechanical one, it should easily be prevented by considering the hydrostatic problem involved. In other words, if we lessened the volume of blood by the quantity of fluid that we are to inject, there should be no serious change in the circulating system. This has proved to be the case; patients showing this type of reaction are first bled from 150 to 200 c.c. of blood, and then the arsphenamine solution is injected through the same needle. The success of this method is graphically shown in table I.

Another way of lessening the volume of fluid is by increasing the apparent size of the circulating system itself. This should be readily accomplished pharmacologically by the use of vaso-dilators, which would not only increase the size of the system but would also increase the probability of absorbing the drug by carrying the arsphenamine solution to the remote parts of the body. Theoretically, then, this should be a better method than the actual loss of blood described above.

Working upon this hypothesis, Barnes<sup>2</sup> has recently suggested the use of nitroglycerine and other drugs of the nitrite series as a remedy of the post-administrative complications of arsphenamine therapy.

On the other hand, Cushny<sup>13</sup> believes that these drugs are unnecessary; he recorded from his experiments that under the influence of arsenic the capillaries permit the passage of fluid into the tissues more readily than normal, and that the arsenic-bearing compounds are efficient vaso-dilators. Finally, we have to consider the results of Milian's investigations;<sup>3</sup> and here we are presented with a diametrically opposed line of thought. Milian believes that the post-administrative complications of arsphenamine are due almost entirely to the extreme vaso-dilating effect of this drug, and he advocates the use of vaso-constrictors as a remedy for the condition.

Beebson<sup>11</sup> arrived at this conclusion from his experimental work with arsphenamine and he concludes that epinephrin is the drug par excellence for the extreme vaso-dilation which he observed. Stokes<sup>14</sup> believes atropin will protect against the acute reactions.

Whatever may be the specific effect of arsphenamine upon the blood vessels, we have found that the results from a compensating drug therapy have been inconstant and almost without value, yet the same patients treated with a pre-administrative decrease of blood volume have shown a significant lessening of symptoms, and clinically we believe it to be the treatment of choice for this type of reaction.

The second type of reaction which may follow the use of arsphenamine develops within the first twenty-four hours after the reception of the drug. It may start within twenty minutes but the majority of our cases have occurred from three to eight hours after the injection. The patients present nausea of varying severity,

vomiting, severe throbbing frontal headache, vertigo, hyperpyrexia, occasionally severe abdominal pains, and pains throughout the bones and joints. A sudden diarrhea is common. The urine is usually increased in volume and has a specific gravity which is higher than its volume would indicate; traces of albumen and a few casts are commonly found, but of great significance is its reaction, which is almost invariably *alkaline*. The symptoms increase in severity for about two to six hours and then gradually clear up, leaving the patient weakened but not seriously affected.

This is the most common reaction following the use of arsphenamine and its occurrence has been recorded by many observers. We had 48 such cases, representing about 9.6% reaction; in other words, one person in ten will react in this fashion. This agrees with the figures of other large syphilitic clinics.

The treatment of this type of reaction depends upon the conception of the factors involved in its production, and these we believe are directly concerned with the preparation of the drug for intravenous use. In the following pages we shall attempt to demonstrate that the reaction is essentially a manifestation of *alkalosis*, and can be successfully treated on this basis.

Supportive treatment is also important. We have found that those patients who have been prepared for the injection by having pre-operative purgation, nothing but liquids by mouth, and rest in bed for 24 hours after the injection, have suffered less than those not so prepared.

The third type of reaction is not common; in our series we had three cases, or 0.6%. It is shown by those patients who present an alleged idiosyncrasy or intolerance toward the arsenical compounds. This reaction has been described as a sub-acute or delayed arsenic poisoning which develops a well-known clinical picture. Several days, or possibly weeks, after an injection of arsphenamine the patient begins to grow gradually weaker, the appetite is lost, vague and shifting pains are complained of; a severe diarrhea, occasionally constipation, occurs. The patient suffers from an increasing gastritis, with uncontrollable nausea and vomiting. Hematemesis is not uncommon in severe cases. The liver dulness is said to decrease, although our cases have not shown this feature. There may be jaundice. The urine is usually

scanty, high colored, with traces of albumin and hyalin casts. Bile and blood cells are found. One occasionally finds traces of sugar.

The cutaneous manifestations are probably the most interesting. One of our cases, which terminated fatally, showed small petechial spots over both thighs and abdomen; these spots grew larger, were exceedingly painful, and after attaining the size of a silver 25-cent piece gradually disappeared after showing the various color changes of absorbing blood pigment. This patient, a woman of 38, had received one dose (0.4 gm. arsphenamine) and developed symptoms in five days. Her nausea and vomiting persisted for about a week, leaving her greatly weakened. A few days later the purpuric spots developed and then gradually increasing jaundice. Death occurred six weeks after the administration of arsphenamine. The post-mortem findings were consistent with an arsenic poisoning. There are about ten other such cases reported in the literature and all show essentially the same findings.<sup>2</sup>

Our other cases (two in number), after developing a more or less diffuse purpuric rash accompanied by a severe gastro-intestinal upset, gradually cleared up under supportive treatment.

The fourth type of reaction, the so-called Herxheimer reaction, we have seen in only one of our cases, due, perhaps, to the fact that our clinic consists of young adults, and few of our patients are over 50 years of age. The one case referred to was a tabetic of 58 who presented alarming cerebral symptoms for four days, and then cleared up.

Under these four types, then, we believe that the complications following the administration of arsphenamine can be classified. As for the prophylaxis and treatment of the last two, we have learned little or nothing from our work. Fortunately the first two classes are the most common and we feel that these disagreeable complications may be entirely eliminated or greatly reduced by observing certain important factors. The mechanical or hydrostatic principle has already been described; there is left now to be considered the actual administration of the drug.

## II.

### THE ADMINISTRATION OF ARSPHENAMINE.

There are two distinct procedures concerned in the actual administration of arsphenamine:

First, the preparation of the drug for intravenous use; and secondly, the injection of the solution into the vein.

### THE PREPARATION OF ARSPHENAMINE FOR INTRAVENOUS USE.

Arsphenamine is the official trade name of several compounds which bear more or less resemblance to the original formula of salvarsan as described by Ehrlich.<sup>15</sup> The complexity of the process of manufacture and the chemical instability of the drug itself have caused many variations in the final product, so much so that it is a notorious fact that physicians find it almost impossible to obtain two samples of the drug that are alike, either in their physical or chemical behavior. Even samples of the same brand will vary to a marked degree.

Clinicians have long fretted over the variations of solubility of the drug in water. The color of the dissolved drug is different for each preparation, although made up under similar conditions. The H-ion concentration of the different preparations varies tremendously, and for this reason, if for no other, the previous attempts to standardize the preparation of the drug for intravenous use have failed.

It is impossible to calculate or even predict with any accuracy the amount of alkali required to neutralize a given solution of dissolved arsphenamine and to redissolve the precipitate which forms. Manufacturers of the drug realize this fact, and yet they are required to give explicit directions for preparing the solution. They must needs be evasive as to the amount of alkali that should be added, leaving it to the experience and judgment of the user to determine the degree of alkalinity to be attained. To quote from one trade circular, "An excess of alkali is to be avoided, as it may produce local disturbance. The solution must under no conditions be acid, because that would mean increased toxicity."<sup>16</sup>

Other manufacturers tell us to add sodium hydroxid until the solution is alkaline to litmus,<sup>17</sup>—a confusing statement when the solution becomes alkaline to litmus long before the precipitate redissolves, as is not infrequently the case.

The clinician is usually activated by one thought—to redissolve the precipitate and obtain a clear solution. He therefore continues to add alkali until the solution becomes clear. He would be startled and not a little uneasy if he

really knew the alkalinity of the solution which he intends to inject into the veins of his patient. Titration experiments have shown us that solutions so made up are usually 16 to 18 times as alkaline as an equal volume of blood, and some solutions run as high as 40 times.

Investigators of the post-administrative reactions from arsphenamine have apparently ignored this fact and have looked otherwise for the source of trouble. For example, Thompson<sup>18</sup> believes that the chills and fever which follow the injection of arsphenamine are due to the subnormal temperature of the solution used, and he has devised an apparatus for keeping the solution at body temperature. Temperature, however, can be only a small factor in the immediate type of reaction, and surely has nothing to do with reactions developing some hours after the reception of the subnormal solution.

Rieger<sup>19</sup> claims that commercial arsphenamine decomposes to form an arseniureted methyl compound which is the cause for most reactions.

Jackson and Smith<sup>20</sup> have done exceptional work in this field. They examined many intermediary compounds occurring during the process of manufacture of arsphenamine and they concluded that these compounds were not very poisonous and in no way could account for the variable toxicity of the different samples of arsphenamine. Their experimental work showed that the reactions were first indicated by a dilatation of the right side of the heart, with an increasing pulmonary pressure and a slow fall of the systemic pressure. The cause of the rise in pulmonary arterial pressure they believed might be explained by the alkalinity of the solution used, and partly to a specific effect of the drug itself.

If a strongly alkaline solution is injected into a man's veins, he soon has difficulty in breathing, complains of a sub-sternal pressure, and shows alarming signs of collapse. He soon recovers from the immediate violent symptoms and then develops nausea, vertigo, vomiting, headache, hyperpyrexia, malaise, and vague and shifting pains. He will have diarrhea and complain of thirst. Harrop<sup>21</sup> injected a concentrated solution of sodium bicarbonate into the veins of a patient whom he was treating for corrosive sublimate poisoning and found the symptoms enumerated above to follow the use of such an alkaline solution.

If, then, intravenous injections of hyperal-

kalin solutions can cause such reactions, may not the condition which follows the use of arsphenamine be due entirely to a similar condition which has recently been described as *alkalosis*?<sup>22</sup>

*Alkalosis* is a relatively new word used to explain a condition of disturbed chemical balance in the body fluids, apparently the opposite of *acidosis*. It means an increase in the alkali content of the blood stream particularly, and occurs in a few ill-defined pathological conditions.

The urinary findings in alkalosis are significant. The urine is alkaline, the specific gravity is high, and the normal volume is increased. McLeod and Knapp<sup>23</sup> discovered that lactic acid appeared in the urine when alkalosis was produced by injecting hyperalkaline solutions intravenously.

Table II represents a series of urines from patients who showed post-administrative reac-

TABLE II. URINARY EXAMINATION IN TWENTY CASES SHOWING POST-ADMINISTRATIVE REACTIONS.

PATIENT	I. BEFORE INJECTION			II. AFTER INJECTION			Lactic Acid
	24-hr. vol.	Reaction	Sp. gr.	24-hr. vol.	Reaction	Sp. gr.	
1	830	acid	1012	960	alkaline	1024	0
2	1120	acid	1006	1230	alkaline	1021	0
3	940	acid	1008	1054	alkaline	1019	+
4	880	acid	1017	806	alkaline	1027	+
5	640	acid	1012	1090	alkaline	1021	+
6	1010	acid	1010	1090	alkaline	1020	+
7	1264	acid	1008	1234	acid	1012	++
8	900	neutral	1012	988	alkaline	1022	++
9	872	acid	1021	1056	acid	1024	+
10	950	acid	1016	1180	acid	1022	+
11	840	acid	1008	978	alkaline	1021	+
12	680	acid	1024	930	alkaline	1027	+
13	710	acid	1016	880	alkaline	1025	0
14	714	acid	1014	1120	alkaline	1019	++
15	800	acid	1021	1040	alkaline	1024	0
16	610	acid	1022	878	alkaline	1020	+
17	786	acid	1014	1108	alkaline	1018	+
18	940	acid	1020	1310	alkaline	1021	0
19	820	neutral	1014	1010	alkaline	1024	+
20	1180	acid	1007	1224	alkaline	1026	++

tions. The urines were collected for 24 hours before and after the injection, and the volume, reaction, specific gravity, and the presence of lactic acid were determined. The figures are striking. Nearly every urine was alkaline, increased in volume, and of a higher specific gravity. The test for lactic acid was positive in 15 out of the 20 cases.

We believe that these figures tend to indicate that the reactions which follow the intravenous administration of arsphenamine are merely manifestations of what may be called "acute alkalosis" due to the hyperalkalinity of the solution

used and that the specific effect of the drug itself plays but a minor rôle in the reaction.

The remedy is apparently simple. It means a reduction in the alkalinity of the solution used. It means not greater care on the part of the physician in preparing the solution, for he must use sufficient alkali to obtain a clear solution, regardless of its concentration, but it means the preparation of a compound by the manufacturers which is less acid and which will require a less alkaline solution for its administration.

We can further aid in preventing these disagreeable reactions by treating the alkalosis symptomatically. Wilson<sup>24</sup> has demonstrated that the administration of acids will relieve the condition. Our experience has shown us that patients developing these reactions are promptly relieved by feeding them with acid substances. The juice from the citrus fruits, vinegar salads, pickles, other sour foods, sodium acid phosphate, etc., can be given. We have found that the urine is a perfect index of the condition. A change from alkaline to acid reaction of the urine usually means a cessation of symptoms. It is interesting to point out at this time that the urine of patients who have received arsphenamine and who do not show reactions is invariably acid. We have very carefully followed the urines of over 400 cases which have shown no reactions and have found every one to be acid, and to show no changes either in specific gravity or volume.

In brief, then, we believe that the post-administrative reactions which follow the use of arsphenamine are due for most part to alkalosis induced in susceptible persons by hyperalkaline solutions of arsphenamine and that the condition can be greatly relieved by the production of a less acid arsphenamine and by adding to the body acid equilibrium when the symptoms of alkalosis develop.

#### THE INTRAVENOUS INJECTION OF ARSPHENAMINE.

Solutions may be introduced into a vein either by squirting or by pouring. A solution is squirted or forced into a vein with the aid of a pump or syringe: it can be poured into a vein by allowing the principles of gravity to come into play. Both of these methods have been employed by clinicians administering arsphenamine.

Ehrlich's original procedure described the

use of a glass pump, but the tendency in recent years seems to show a gradual discarding of the pump method in favor of the gravity method. The latter method has the advantage of maintaining an even pressure which can be regulated with great exactness: there is less danger of air leakage with the possibility of air embolism, and finally it reduces the number of persons engaged in the operation and thus reduces potential sources of trouble. Indeed, the superiority of the gravity method is well summarized in the statement of Milian that the syringe is responsible for certain fatalities that might have been avoided by pouring instead of squirting the fluid into the vein.<sup>8</sup>

Arsphenamine can be administered in two ways: alone or together with physiological salt solution. There seems to be great difference of opinion among those who administer the drug as to which is the better method. Nelkin<sup>25</sup> reports that in a large series of cases in which no salt solution was used he had no greater percentage of reactions than in other large clinics where salt solution was employed as a routine measure. On the other hand, the careful experimental work of Danyesz<sup>26</sup> on rabbits seems to show that physiological salt solution is indispensable in the successful administration of arsphenamine.

Our own work upon this subject has convinced us that salt solution will diminish and even prevent some of the reactions which follow arsphenamine. For example, a series of 50 doses of arsphenamine were given without salt solution, and on subsequent weeks the same patients received salt solution with arsphenamine. In order to eliminate errors of preparation, the patients were divided into two groups, one-half of whom received salt solution, while the other half received straight arsphenamine from the same solution of the drug.

Of the 50 doses unaccompanied by salt solution 20 showed characteristic reactions, while of the 50 doses accompanied by salt solution only four showed reactions. In other words, the administration of physiological salt solution with arsphenamine in our experiment lowered the reaction rate from 40% to 8%, making the preparation one-fifth as toxic. It thus seems to us that there is a very definite indication clinically for the use of salt solution.

There have been many types of apparatus

devised for the injection of arsphenamine and salt solution, and there is need for these different methods for they are applied to different requirements. The physician who gives but one injection does not require the apparatus which a man who gives 10 injections is forced to employ. Likewise a special apparatus finds its need in clinics which administer 20 doses at one time. Finally the large clinics that give over 20 doses must consider an apparatus which will economize their time, attendants, drugs, etc., as far as possible.

In the following pages is described an apparatus which has been employed successfully at the Long Island Hospital for some time. It was devised by the author in the attempt to simplify and reduce the non-essential activity that accompanies the administration of arsphenamine in a large syphilitic clinic. As the photographs will indicate, the apparatus is constructed with the utmost simplicity, yet it reduces to the mere opening and closing of a few valves the injection of 25 or more doses of accurately measured arsphenamine and salt solution at the same time. It requires but one sterile and one non-sterile attendant to run the entire clinic. Any dosage from 0.03 gm. upward can be given. The physiological salt solution can be given before, simultaneously with, or after the arsphenamine. Any degree of pressure from 0 to 150 m.m. of mercury can be obtained. The apparatus is practically automatic and having once been set up, it will deliver 25 or more doses without further attention.

The apparatus is constructed upon the hydrostatic principles involved in the self-filling burette of the chemical laboratory. It consists of a sturdy upright rod which is supported by a heavy base. A sliding sleeve or carriage is nicely fitted to the upright and is adjustable to any height. This carriage in turn supports two smaller uprights (see photographs) which hold the reservoirs and measuring burettes. The reservoirs—glass flasks—are securely held by adjustable wooden clamps, the jaws of which are protected by a two-inch thickness of soft felt to prevent the crushing of the glass. The burettes are firmly held by metal clasps which fasten around their flanges. The burettes which we have used are 300 c.c. in capacity, graduated to 5 c.c.

The weight of the sliding carriage and its uprights, together with the loaded reservoirs, is

nicely counterbalanced by an iron dead-weight which slides on a smaller rod and which is connected to the carriage by a light steel cable that turns over a wheel above. In addition, the carriage has a screw clamp which immobilizes it when the desired elevation or pressure has been attained.

The tube connections are readily seen in the accompanying diagram. A glass syphon tube is placed in the flask-reservoir and to this is attached a rubber tube which is connected to the burette by way of a hard rubber or glass T-tube. The stem of the T-tube is in turn connected by a second rubber tube to the delivery tube. A pinch-cock (No. 1 and 2) is placed between the syphon tube and the T-tube and completes the system which automatically refills the burettes when they are empty.

The arsphenamine system and the salt solution system are connected by a glass Y-tube and the main delivery tube is connected to the stem of this Y-tube. A pinch-cock (No. 3 and 4) is placed between the burette and the Y-tube and this controls the outflow from the burette. Referring to the diagram, then, pinch-cock 1 controls the re-filling of the measuring burette from the salt solution reservoir, while pinch-cock 3 controls the amount of salt solution which is delivered to the patient. On the other side of the apparatus, pinch-cock 2 controls the re-filling of the arsphenamine burette, and pinch-cock 4 controls the dose that is to be given. At the end of the delivery tube is inserted a metal adapter which slips easily into the usual Schreiber 18-gauge needle with thumb guard.

A word about the delivery tube holder will not be amiss here for we believe that this has supplied a long-felt need, regardless of the apparatus used. One of the most annoying incidents which the operator meets with in the administration of arsphenamine is the constant shifting and the exasperating entanglements of the delivery tubes. In the activity associated with the coming and going of patients, with their adjustment upon the table, and with their preparation, the delivery tubes are often apt to become hopelessly entangled or to drop upon the floor. The operator sometimes makes futile attempts to hold them with impromptu weights or clamps them to the table cover. The following little instrument takes care of the situation without difficulty. It consists of a heavy metal base which supports an ordinary nickel-plated

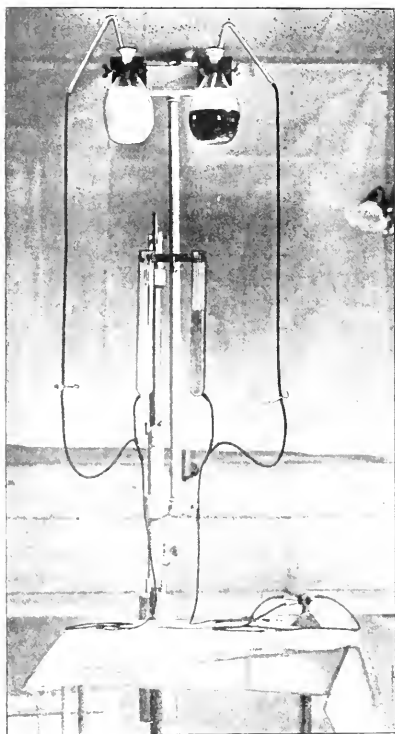


FIG. 1.—Arsphenamin apparatus.

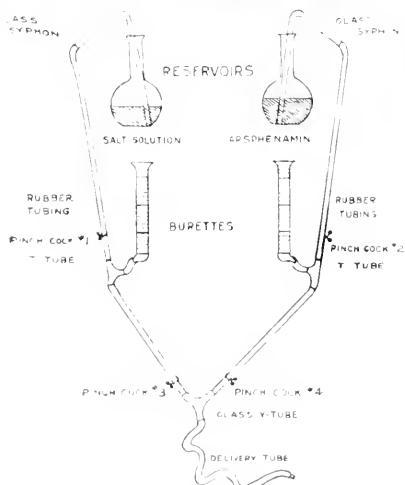


FIG. 1.—ARSPHENAMIN APPARATUS

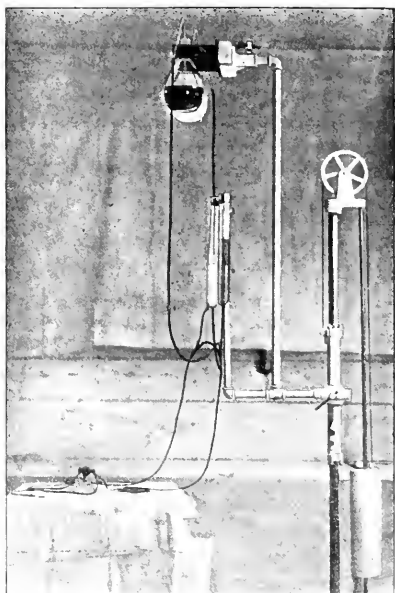


FIG. 2.—Arsphenamin apparatus.

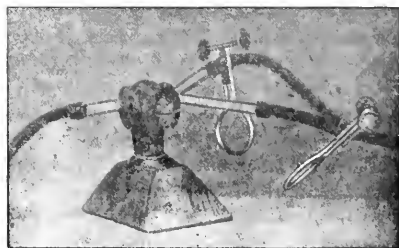


FIG. 3.—Delivery tube holder.

pipe clamp (see photograph). A one-hole rubber stopper is fastened in the clamp and the stem of the glass Y-tube is inserted into the hole. When connected to the remainder of the apparatus it has the advantage of staying where it is put and of holding the delivery tubes immobile. The glass Y-tube is invaluable because it acts as a three-way window—it allows the operator to see which solution is passing through the main delivery tube at any time. The rubber stopper becomes a shock absorber for the glass Y-tube and allows greater freedom in the manipulation of the delivery pinch-cocks.

The apparatus is used in the following way: The flasks, burettes, syphons, pinch-cocks, rubber tubing and delivery tube holder are made



sterile by boiling. A sterile attendant covers a small table with a sterile sheet and then assembles the rubber tube connections with the syphons, burettes, and delivery tubes. The syphons are then placed in the flask-reservoirs containing respectively salt solution and arsenphenamine; sterile gauze is packed into the neck of the flasks to prevent the ingress of dust or flying substances in the air. The flasks are then given to the non-sterile attendant who fastens them in the wooden clamps.

The tops of the burettes are likewise covered with sterile gauze and placed in the burette holders. All connections having been made firm and the pinch-cocks in place, the sliding carriage is raised until the proper pressure has been reached. The syphons are then started in either of two ways: (1) with pinch-cocks 1 and 3 or 2 and 4 open and the burette connection to the T-tube held closed, a sterile glass pump is applied to the main delivery tube and the solution from the reservoirs is aspirated over; as soon as the solution reaches the level of the bottom of the flask it will run itself. Remove the pump, close pinch-cocks 3 and 4 and open burette connecting tube. The burettes will then fill; when the top mark is reached shut pinch-cocks 1 or 3. Opening cocks 3 or 4 will allow the solution to run from the delivery tube. This should be done to free the system of air bubbles. (2) This method is somewhat more complicated but does not require extra apparatus like the pump, which must be made sterile. Just before the reservoir-flasks are put in place, the burettes are half-filled with their respective solutions. With pinch-cocks 1 and 3 or 2 and 4 open, the solution is allowed to run from the delivery tube to expel the air. Then the burette connecting tube is clamped. The solution running from the delivery tube causes a partial vacuum in the system and finally sucks over the syphon. When this occurs, pinch-cock 3 or 4 is closed, the burette connecting tube is opened and the burette is allowed to fill until the top mark is reached. The apparatus is now ready for use.

We have found the following routine procedure to be the simplest and most satisfactory. The patient is placed upon a hospital transfer-wagon, the arm bared, and the cubital space made sterile with tincture of iodine. He is then wheeled to the administering table and a sterile towel is thrown over his hand and fore-

arm. A tourniquet is applied and a Schreiber needle is inserted into the vein. If the needle is freely in the vein, the level of the salt solution burette will be seen to fall evenly after pinch-cock 3 is opened. If this occurs, pinch-cock 4 is opened and the level of the arsenphenamine solution having been noted, the drug is allowed to run until the required dose is given. Cock 4 is then closed; the salt solution is allowed to run for a moment longer, and when cock 3 is closed, the needle is withdrawn from the vein and separated from the adapter. The operation is thus concluded. A fresh sterile needle is used for each patient and the operator remains sterile throughout. He should wash his hands in 1:2000 corrosive solution after each injection.

The entire procedure is thus reduced to the opening and closing of pinch-cocks 3 and 4. It should take from 10 to 12 minutes to inject 120 to 200 c.c. of solution. McCoy,<sup>8</sup> of the Public Health Service, has called attention to the danger of injecting the solution faster than this. Under these conditions, then, the apparatus will deliver about five doses per hour or 20 to 25 doses per clinic morning.

For very large clinics, caring for more than 30 patients, a double battery of burettes can be used and two patients can be injected at one time. The burettes are fed from the reservoirs by connections to the same syphon. Theoretically, the principle can be expanded to a five-battery system, injecting five patients at once and delivering 125 doses per clinic morning. It is doubtful, however, whether there are clinics which attempt to treat over 50 patients per morning, and hence the single or double battery-burette system will cover the needs of most clinics.

In the foregoing pages we have attempted to record the results of our investigations at the syphilitic clinic of the Long Island Hospital. They are written with the hope that they may aid in the development of a successful rationale of therapy which will eventually control that most dreadful of our preventable diseases—syphilis.

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## TORSION OF THE OMENTUM.

By EDW. H. RISLEY, M.D., F.A.C.S., BOSTON.

It is desired to report this case because it illustrates one of the factors to be considered in making a diagnosis of the acute abdomen and because it seems likely that etiologic factors not previously mentioned in the literature were present in this case.

Mr. J. D., age, 38, seen in the male medical o.p.d. of the Massachusetts General Hospital in consultation with Dr. Guy Mead, on September 14, 1918, at 10 a.m.

P. H. Unimportant; had never had any acute illness or fever except malaria many years ago.

P. I. For past two weeks has had a severe backing cough with no fever and very little sputum. Cough has been paroxysmal and violent. For past 24 hours has had nausea but no vomiting, and slight pain midway between the appendix and gall-bladder, radiating across the abdomen to the left. The bowels have moved without medicine and there has been no fever. There is no history of violent muscular exertion or heavy lifting.

P. E. shows a large framed, muscular, robust laborer who lies quietly on the table evidently without pain, but who is frequently seized with violent fits of coughing. Throat, negative; larynx not examined; lungs, many coarse râles scattered throughout both sides; no dullness or change in respiratory note; heart, negative; temperature 98.8; pulse, 80; abdomen not distended, soft, no muscular rigidity, no masses, but very slight tenderness on deep pressure directly above McBurney's point; rectal examination, negative.

Sent to medical wards for observation. Diagnosis: Acute diffuse bronchitis; question of appendix.

At 7 P.M. Temperature: 99.2. White count had risen from 9000 at 4 P.M. to 14,000; slightly increased tenderness in R.L.Q. and tender high by rectum. Seen in consultation with Dr. F. T. Lord, who stated that nothing but a diffuse bronchitis could be demonstrated in the lungs. Exploratory laparotomy under local anesthesia advised.

8.30 P.M. Operation. E.H.R. Novocaine anesthesia; peritoneum opened, no free fluid, appendix normal in size, color, and contour; absence of omentum in this region noted. During further exploration of the abdomen the finger came in contact with the tip of a lemon sized mass in the region of the gallbladder.

As it was thought likely that a condition not easy to be handled under local anesthesia was to be dealt with, the original incision was closed in the usual manner and the patient given gas-oxygen and a high right rectus incision made. On opening the abdomen here again absence of the omentum was noticed but a distinct odor of gangrene was detected. On introducing the hand into the abdomen, a firm, rounded, irregular, movable mass the size of a lemon was grasped in the hand and pulled out of the incision. The mass proved to be composed entirely of omentum which, from two complete twists at the right free edge, was rolled up into the form of a sphere, was red, injected, hard, and on section had a necrotic centre.

This was tied off and removed. No other pathology was found. The remaining portion of the omentum was perfectly normal in every respect; there was no sign of any peritoneal irritation anywhere. The abdomen was closed without drainage.

The patient made an absolutely uneventful

recovery, his bronchitis quieted down and he left the hospital on the 12th day apparently perfectly well. When seen three months later he was free from symptoms, was working hard and had no weakness of his abdominal muscles.

Torsion of the omentum *per se* is a rare condition; only 131 cases having been reported in the literature prior to 1914. It most commonly occurs in the presence of herniae, some inflammatory condition in an adjacent organ, or following violent peristalsis, accompanying some intestinal disturbance.

It has also been found after sudden severe muscular strain and once in pregnancy, its occurrence in the latter condition probably being due to an old inflammatory condition in the pelvis to which the free edge of the omentum was adherent.

It is extremely rare in absence of some distinct intraabdominal exciting cause, which is generally mechanical (complicating hernia) or more commonly inflammatory.

Various theories as to the mechanism are advanced, among which the following seem the most plausible.

1. Torsion occurs as the result of adhesion to some adjacent inflammatory condition.

2. The twist may be due to the fact that the overdilated veins of the omentum wrap themselves, and incidentally the omentum itself, around the stiffer and shorter arteries. This dilatation of the veins may occur as the result of any transient or permanent intraabdominal or possibly extraabdominal congestion.

3. The omentum may be made to flow or roll by the peristaltic movement of the intestines or by the unequal pressure within the abdomen, along the line of least resistance; the omentum being compared to a handkerchief, folded triangularly, which is fastened at two corners, allowing the third to rotate.

The torsion may involve the whole omentum or only a small portion of its free (or attached) edge.

In the above case none of the etiologic factors mentioned were discoverable. A microscopic section of the matted ball of partly gangrenous omentum was not made, but from the history and physical findings it seems likely that one of two probable factors was present as the exciting cause in this case, neither of which has been mentioned before in the literature.

- A. The torsion was caused by the rather

prolonged and violent cough from which the patient had suffered for two weeks; the act of coughing producing violent agitative motions of the diaphragm and adjacent abdominal organs caused a change of pressure and hence the twist; or

- B. A small infarct may have occurred in the lung as is not uncommon in such cases of bronchitis and which is not to be detected by the stethoscope—and from which a small embolus had been detached and carried to the vessels of the great omentum. Because of the matting no definite outline of the involved blood supply could be made out in this case.

The two above theories are offered as possible etiologic factors in the production of torsion of the omentum in absence of other demonstrable cause.

Careful analysis of cases reported shows that there is no symptom or symptom complex which is typical or even definitely suggestive of this condition.

Pain of varying degree is the most common symptom and is generally located in the right iliac region. Nausea is more liable to be present than vomiting. The bowels may or may not be affected. The temperature generally shows only slight elevation.

Physical examination generally reveals some form of indefinite tumor mass which may or may not be tender, depending on the length of time after torsion has occurred.

Purely abdominal torsion of the omentum probably cannot be diagnosed. The conditions which torsion simulates or which simulate torsion are most commonly: *tabes mesenterica*, *appendicitis*,—acute or chronic,—low grade obstruction of the bowels, abdominal abscess, tumors of the mesentery, *volvulus*, *mesenteric thrombosis* and *retroperitoneal new growths*.

Not all of these conditions call for immediate operation and, in consequence, torsion of the omentum may often fail to be diagnosed because of its insidious onset and lack of pronounced symptoms, its accompaniment of low temperature, pulse and respiration and the indefinite history of any exciting cause.

The presence, however, of a slight elevation of temperature, persistent nausea, more or less abdominal (constant) pain, and the detection of an indefinite abdominal mass which is moderately tender to palpation should, in the absence of other definite factors, make one suspicious of

a torsion of the omentum—especially if there is a history of previous hernia, an inflammatory process in the abdomen or any cause for violent disturbance of intraabdominal pressure.

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## SURGICAL TREATMENT TO PREVENT AND MINIMIZE PERMANENT DISABILITIES.\*

By FRANCIS D. DONOGHUE, M.D., BOSTON,

*Medical Adviser of Industrial Accident Board of Massachusetts.*

A STUDY made by my friend, Carl Hookstadt, under the direction of the Department of Labor ("What Becomes of Men in Industry," *Monthly Labor Review*, July, 1918), emphasizes the fact that proper surgical treatment could prevent and minimize permanent disabilities, and is inseparably connected with adequate supervising authority and responsible direction of the injured man as a man.

Our thanks should be due to the Honorable William B. Wilson, Secretary of Labor, who, through Dr. Royal Meeker, has made possible this timely contribution to our knowledge and end results.

Compensation laws have now been in existence in this country for six or seven years and a large mass of experience must teach us many lessons if we have time to take stock. Six years of experience in the administration of workmen's compensation laws must be thoroughly convincing to everyone who has had to do with them that the best kind of medical treatment is the cheapest. This question cannot admit of argument.

Getting the treatment to the man or getting the man to the treatment is a thing over which the Industrial Accident Boards do not have sufficient control.

In my own State, the treatment is given under the direction of twenty-four insurance companies, each handling the case in its own particular way and the Accident Board acts only

when bad results have occurred or good results have not been obtained.

In general terms, the speed with which employees may be returned to work in surgical cases will depend upon the man and the system under which such cases are handled. Cases should not be sent to institutions which lack the methods of making proper diagnosis or the surgeons qualified to render the particular treatment, and the Accident Boards should have the power to regulate the institutions to which these cases are sent.

The system which obtains in Massachusetts of sending cases to the open ward of hospitals endowed or maintained for charitable purposes is not a good one and the treatment of industrial cases in hospital out-patient departments should not be permitted unless special arrangements are made so that a properly qualified surgeon shall actually carry out the treatment.

To refer to cases to show how men suffer from inadequate medical and hospital service would be to repeat in more or less detail all I have said since I became Medical Adviser of the Massachusetts Industrial Accident Board.

As the cases that come to our Board are the poor results, our viewpoint is apt to be distorted because we do not see the thousands of cases in which adequate service has been rendered, and injured employees properly restored economically.

Adequate surgical treatment to prevent and minimize permanent disabilities is the same kind of treatment which will minimize the loss resulting from the less serious forms of injuries. The permanent disabilities represented by the amputation of an arm or leg or by the loss of an eye, are evident, and occupy attention out of proportion to their relative value in industrial injuries.

Less intrusive upon the eye of a claim adjuster and making a less insistent appeal to the administrators of the compensation acts, are injuries to the hand.

Rather than discuss in abstract terms, as I think I have before, the whole surgical field, I am going to take up briefly one group of cases and endeavor to focus your attention upon injuries to the hand. The hand is such an important factor in the earning capacity of an injured employee that we have given special attention to this type of case, endeavoring to educate insurers and others to the necessity of

\* Read at the fifth Annual Meeting of the International Association of Industrial Accident Boards and Commissions, on September 26, 1918, at Madison, Wis.

specialized treatment with the object in view of restoring men to industry with the smallest economic loss. My interest has been stimulated by the successful work of Dr. William E. Browne of Boston, who has in some cases acted as an impartial examiner for the Industrial Accident Board.

Do we fully realize the value of the full capacity of the hand?

Injuries to the hand vary in their severity. These injuries vary in their severity from simple contractures to hands which are claw-like in appearance. The two great causes which result in these deformities are first, sepsis, and secondly, fractures. A great many cases of sepsis occur as the result of too many sutures placed too tightly in some small skin wound. These cases are found most frequently in large relief stations where young, conscientious, but over-enthusiastic internes strive assiduously for a fine looking wound. It may seem strange, but nevertheless it is a fact, that out of every very large series of crippled hands a great percentage of them was attributed to faulty application of sutures. Nearly all the skin wounds with which one meets in industrial accidents may be attended to by careful application of perforated adhesive plaster with a sterile dressing, and most important, a splint. On the whole, these cases do better with dry dressings, probably because the sub-cuticular tissues are made better culture media as a result of long continued and frequent soaking in various solutions. It has been my experience that when it is possible, it is best to apply water running from a faucet, both hot and cold, and then squeeze out the water from the dressing and cover it with a Turkish towel.

A poorly set, a non-recognized, or a slipped fracture of a metacarpal bone will cause a greater period of disability than a poorly treated Colles' fracture. The average length of disability from an impacted fracture of the lower end of the radius is six to eight weeks. Why? Because the lower end of the radius is almost a fixed object, and an ordinary flannel bandage will serve at times to give a man a fairly good wrist. This is very well proved by the fact that many men treated with liniment and a flannel bandage for supposed sprain of the wrist get back to work in six to eight weeks' time although they really had Colles' fracture. On the other hand, the metacarpal bone is a long curved bone with about the same curve in it that

we find in the normal femur. On the flexor surface of this bone we find three tendons; on the dorsal surface one tendon, and to these groups of tendons the lumbrical muscles are attached, and lastly the interossei muscles are attached to the metacarpal bone, so that in the palm of the hand there is a complex anatomical situation with its basic principle, the metacarpal bone. If the metacarpal bone is improperly set, or not set at all, it throws out of normal working order seven muscles, and in turn these seven muscles cause the other muscles of the hand to remain quiet in order to avoid the pain, and at just this point with reference to fractures of the metacarpal bone is the starting point of many crippled hands, which require serious and skilled operative interference in order to prevent them becoming permanent disabilities. In the fingers themselves where compound fractures of the phalanges are found, or simple fractures in poor position, interference with the action of the flexor or extensor tendons may result, causing a long continued disability and not infrequently resulting in amputation. It has been my experience that removal through careful dissection of the smaller fragments of a fractured phalange (when in poor non-working condition) gives the man a working hand much better than any other way. This removal of pieces of fractured phalange must be done without any injury whatsoever to the synovial sheath of the flexor tendon.

There are many rules which one might lay down with reference to the treatment of fractures of the small bones of the hand. But in the treatment of these fractures the one greatest thing to bear in mind is that these bones serve as levers for the movement of tendons, and that interference with the plane of the bone will cause interference with the movement of the tendons. The greater the disturbance of the bone the greater the disturbance in the tendon; the greater the amount of pain in the hand, the longer the man's period of disability.

With reference to the soft tissues as a whole in the forearm and hand, it is difficult to say a great deal or to say anything which will mean very much to anybody. For example, if a man has pain in the index finger of his right hand, can that pain be due to abnormal position of structures in the little finger of the hand? If a man has flexor and extensor tendons, which in themselves are all right, why should he not have normal flexion and extension in the distal

balances of his fingers! This brings up the lumbrical muscles question. A man with a thumb and index and a little finger can do almost as much with such a hand as a man with all fingers present. When tendons have sloughed in the palm of the hand they may be very well replaced by fascia lata and get good results, but in order to get a good result it is necessary to make a quick and careful dissection of the parts into which the graft is to be placed, and if you place a graft in a finger in an anatomically correct position, making allowances for the movement of the finger, allowances for amount of contracture in the graft you put in, you will restore the greater percentage of crippled fingers.

Every man is *not* qualified to operate upon the hand. Surgeons of great experience in abdominal and chest operations or in the treatment of fractures are flat failures when it comes to doing plastic operations upon the hand. These cases are so important that they demand men who are fully qualified in the surgery of the hand itself.

The treatment of the hand is not an orthopedic proposition, in the sense that orthopedic surgeons alone should be allowed to treat it. It is a capital problem in major industrial surgery.

I would like to say one word here of the tendency of the orthopedist, who is really a mechanician, to invade the surgical field by means of operations. Orthopedic surgery is still in a state of transition and perhaps general surgery itself is in a period of transition, many general surgeons coming to know that they are incapable of carrying out long continued mechanical treatment; while, on the other hand, the surgical training of the orthopedic men is, as a rule, deficient and their surgical sense is of late development. They have not had experience in surgical clinics and have not been called upon to treat acute surgical emergencies, the results of which have afterwards drifted into their hands. It almost may be said that they lack general surgical diagnostic ability although extremely keen to sense mechanical conditions that a general surgeon constantly overlooks.

Orthopedic surgeons, as a rule, have drifted into surgery through the chronic channel, and we should utilize them only in such cases as they have proved their ability to handle them properly. The orthopedist has taught the general surgeon much by his perseverance and patience in the

non-spectacular problems of neglected surgical cases. Orthopedic surgery during the war has developed wonderfully. Its scope has been materially enlarged, and from its vast experience great good may be obtained for our industrial cripples.

Cases should be held under such control so that all instructions of the surgeon should be made effective and when the period of active treatment is over, if the employee does not at once return to work, there should be a follow-up system to persuade the employee to return.

Right here let me say that one of the greatest factors in prolonging disability is in preparing the mind of the injured workman for his first plunge back into industry.

After a severe injury, if the man goes back to work for one day in a week and is given his compensation for the full week without deduction, and the second week, two days or three days, finally, at the end of the third or fourth week he has re-acquired his self-confidence in his own capacity.

Serious injury undoubtedly shakes a man's confidence in his ability to do work until he again finds himself. The longer he is allowed to drift, the longer he remains unemployed; the longer he remains away from treatment that will restore him, the further he falls in the economic scale; and as he falls in the economic scale, his sense of uncompensated injury may become a fixed idea, so that in addition to the difficulty in remedying a mechanical condition, we have to do with a mental condition no less trying.

To most men advised to return to work, their conception of work is based on previous experiences, and employees should not be made to feel that they are being forced back to work before they are able. To find that a non-English speaking laborer whose only occupation has been the labor of the pick and shovel should return to light work and his compensation should be reduced is an absurdity. Something more is needed than turning the employee loose with the advice that he should find some light work. He has been working under the watchful eye of the boss and his idea of work is to keep up with his fellow workman and produce all that is required every day.

Under a proper system, working in conjunction with the physician, hospital, or educational influence, persuasion may be necessary, not only applied to the employee but to the employer, fol-

lowed down to the immediate superior of the employee; and above all, to the insurance adjuster, if he does not comprehend the problem and how it should be managed.

Industrial Accident Boards should be keen to help in the replacement work of the wounded of our great war. We should be alive to the opportunity that is afforded to develop industrial surgeons through the great opportunity of concentrated work.

The improved methods developed for the treatment, cure, and rehabilitation of the crippled in the army of warfare should be made available for the improved handling of the injured or disabled in the army of industry.

Hand in hand with adequate medical and surgical diagnosis and treatment must go a firm, direct, and controlling administrative function.

## A CASE OF ASSOCIATED PAINS IN THE KNEE AND PENIS.

By HERMAN W. MARSHALL, M.D., BOSTON.

A man of medium height, weight, and average muscular development, who is in fairly good health and slightly past middle age, noticed a disturbance of sensation come on gradually without apparent cause in the area of distribution of internal pudic nerve filaments upon the dorsum of the penis. There has been pain at times also upon the inner side of the left knee, usually sharply localized as a small spot, but encircling the patella when at its worst.

When the penile pain is most pronounced the knee also is most painful usually, and the character of the symptoms in both places has been a burning feeling increasing to a stinging ache.

For two years the patient has suffered without securing relief from services of eight doctors whom he has consulted.

A genito-urinary specialist examined the bladder cystoscopically and found no abnormality. The urethra was dilated with sounds without effect. X-rays of the pelvis were negative, and finally the seminal vesicles were removed on account of obstructed orifices. There was relief from the pains while he remained in bed after the operation; but on resuming activity the symptoms returned.

He has been seen by a well known neurological

specialist in Boston who did not believe that there was a definite neuritis of the internal nerve, and who referred the patient to the writer for an opinion regarding the possibility of some obscure orthopedic defect being the cause of the pains.

Physical examination of the patient was negative for objective signs, as it was first made by the writer. X-rays previously taken were negative, and adhesive strappings applied around the pelvis in a manner to reinforce pelvic ligaments had no effect on the symptoms. There was no discoverable abnormality of the knee.

A possible diagnosis therefore had to be thought of wholly from history of the case and from the subjective symptoms.

In reviewing the history, it should be mentioned that the patient has been able to continue his work as interior decorator, but at times has broken down nervously. He is very miserable at times and then he has partial cessation of the pains for a while.

He has found that walking, stooping, and moving around will sometimes relieve him, also he discovered that the pain ceased after sitting fifteen or twenty minutes in the chairs at a moving picture theatre which he frequently went to. While taking a bath there is also often cessation of the symptoms, and when lying abed he is usually free of pain.

The writer was unable to make the data mentioned fit any set of symptoms known to accompany muscular or ligamentous strain, bone or joint infections, or osseous new growths. Yet the problem seemed such a definite anatomical one that finally the possibility of an obturator hernia was thought of; and at the next visit of the patient he was re-examined.

While he lay on his back with thigh semiflexed and abducted, pressure was made with the finger over the left obturator foramen behind the insertions of the adductor muscles of the thigh. Definite localized tenderness was discovered, and he remarked that he never knew before that he had this sore spot. Outwardly there was no bulging nor appreciable changes in adductor muscles.

Pressure of the finger over the left sacro-sciatic opening of the pelvis elicited a feeling of weakness when the pressure was made hard enough, but no sensation of abnormal soreness as at the obturator foramen.

Further inquiry brought out the fact that the

penile pain was worse on the left side, which is significant in view of the pain in the left knee. Penile symptoms were referred, however, to the entire tip on both sides extending back a distance of one and a half inches.

A truss constructed of appropriate sized felt buttons which were attached to a strap of several layers of adhesive tape was put on the patient so that obturator and sacro-sciatic foramina were pressed upon. The result was found to be simply that the sciatic pad was uncomfortable to sit on, and the obturator button did not relieve the symptoms although at first it was imagined that it did. This contrivance, therefore was abandoned.

#### INTERPRETATION OF THE CASE.

Internal pudic nerves pass out of the pelvis through the great sacro-sciatic foramina but pass in again almost immediately through the lesser sacro-sciatic foramina after passing the ischial spines. Then, roughly speaking, they follow the pelvic arches of bone up along ischial rami and pubic rami around inner margins of obturator foramina in company with internal pudic arteries to reach their destination in penile structures. Each internal pudic nerve is enclosed in a sheath of obturator fascia in a part of its course.

Obturator nerves pass into the thighs from the pelvis through obturator foramina in the upper parts of these foramina, and supply abductor muscles, hip and knee joints, and at times furnish branches to integument of thighs and legs.

A hernial bulging of the obturator fascia, if of appropriate size, would conceivably cause a pulling on internal pudic and obturator nerve filaments and give rise to pains such as this patient has suffered.

In view of the tenderness localized over the left obturator foramen, and on account of the variability in the symptoms, a diagnosis has been made of a reducible obturator hernia which pulls or presses at times on the obturator and internal pudic nerves of the left side. Relief is obtained when it does not descend into the hernial sac.

Treatment of this hernia is rather uncertain in its results, and the patient is unwilling to have any more operations now while he is able to work regularly without crippling discomfort. The dangers of strangulation have been made known to him, and he promises to

report immediately to a surgeon if he is unable to relieve the pains by reducing the hernia by the procedures he has learned.

The knee symptoms of this patient scarcely place it in the class of orthopedic cases, but, because it has many sides, perhaps the circumstance that it is reported by an orthopedic surgeon will be overlooked on account of its general interest.

#### GASEOUS EXCHANGE WITH UNPRACTICED SUBJECTS AND TWO RESPIRATORY APPARATUS EMPLOYING THREE BREATHING APPLIANCES.

BY M. F. HENDRY, T. M. CARPENTER, AND L. E. EMMES, BOSTON.

[From the Nutrition Laboratory of the Carnegie Institution of Washington, Boston, Mass.]

(Continued from page 346.)

#### CAN RELIABLE RESULTS BE OBTAINED WITH UNTRAINED SUBJECTS?

One of the specific objects of this series of experiments on the respiratory exchange of man was to determine whether untrained subjects would give reliable results, how many periods might be necessary, and what the possibilities are of the clinical application of methods for determining the respiratory exchange of patients when there is no time for training, and also when there is very little possibility of repetition of the series on a succeeding day. Even a superficial acquaintance with hospital records shows that the opportunities for extended series of observations with no actual change in the condition of the patient, or with sufficient time and assistance to carry them out, are extraordinarily limited. The clinician desires to obtain indexes for diagnosis in the shortest time practicable, the patient desires an alleviation or cure of his condition as soon as possible, and furthermore, the course of the disease may be so rapid that a duplication of condition cannot be expected. Consequently, whatever methods are used in diagnosis, the clinician desires and must have those that admit of no practice effect. We hope that this series of studies will contribute in some measure toward a solution of the question as to whether measurements of the respiratory exchange are reliable when carried out with untrained subjects on only one day.



We have already tried to show that these subjects were as untrained as any patients in a hospital. In fact, in some hospitals the patient is brought to the metabolism room one or more days before the actual measurements are made and the apparatus is explained to him. Not even this was done in the present research. Many of the subjects had not the faintest conception of the experience before them. What happened was that the first subjects told their fellow students about the experiments but the probable effect was to increase any latent apprehension or reluctance rather than to decrease it. No previous information of this kind, however, would contribute in any way to the technical training of the subjects. We feel that in this company of 17 young men we have a typical group of untrained subjects. That we succeeded as well as we did is due, we feel, to the excellent coöperation of the subjects, the smoothness of the routine, and lastly, of more importance here, to the fact that training is not required for securing reliable results. In other words, as a result of all of our evidence and experience, it is our belief that training is not necessary for obtaining results which can be depended upon as a measure of the actual metabolic level of the individual at the time he is measured. We offer as evidence of this the fact that the figures for the oxygen consumption, with the possible exception of those for the first period, show, on the average, that there is really no practice effect as such. The pulse rates confirm this in a measure, if we consider this factor both as an index of apprehension, and of a change in metabolic level during the twelve measurements of the morning. The pulse rates also show that frequently, when high values are secured, they are characteristic of the subject and not due to experimental conditions. We believe that both the pulse rate and the oxygen absorption give evidence that continued experimenting after a certain time tends to cause both of these to rise. Consequently, we recommend that in determining the basal metabolism with a breathing appliance apparatus, the observations should be continued for at least three periods, but no more. That is, there should be one period in which the technique is carried out to demonstrate to the untrained subject that there is nothing objectionable or painful about the observations, and to make sure that all

of the operations are understood, with two additional periods for measurements which are to be considered reliable.

We must repeat here what has frequently been stated in other publications from this laboratory, that a preliminary period of one-half hour of quiet is necessary to eliminate the effect of previous activity, to accustom the patient to his surroundings, and to secure a true basal level. In some cases there may be a delay in reaching this basal level because of the apprehension of the subject which cannot be overcome until the first period has been carried out. There were several instances of this in the present research. The records of the pulse rate are of great assistance in determining the presence of apprehension, the rapidity with which the subject becomes used to the apparatus, and the final general level of his condition. We strongly recommend frequent records of the pulse-rate during the entire stay of the subject in the experimental laboratory.

Our conclusion is, therefore, that reliable results in the measurement of the respiratory exchange can be obtained in the majority of cases with wholly untrained adults, and that after the first measurement practice plays a relatively small rôle.

#### RECOMMENDATIONS FOR PROCEDURES IN THE MEASUREMENTS OF RESPIRATORY EXCHANGE IN SHORT PERIODS WITH UNTRAINED SUBJECTS.

Suggestions for measurements of this character have been given in a monograph from this laboratory, and to some extent recommendations here given are a repetition of those already published.<sup>21</sup>

For the determination of the oxygen consumption alone of an individual in the post-absorptive state at rest, we recommend the use of the Benedict portable respiration apparatus, the rubber mouthpiece and noseclip, together with the Emmes method of control.

If the respiratory quotient and carbon-dioxide elimination are desired in addition, and there is time and assistance at hand to carry out the gas analysis, we recommend the use of a well-counterpoised spirometer, mask,\* or pneumatic nosepieces (Benedict form), and the portable form of the Haldane gas analysis apparatus. In this connection we recommend and

\*None of our subjects had beards, so that an exception might have to be made in such cases.

insist upon an adequate control of the accuracy of gas analyses made by the Haldane apparatus, such as is furnished by frequent analyses of outdoor air. A summary of such controls should be given by investigators using the apparatus.

We advise the use of accessory control apparatus in all measurements of respiratory exchange of any character. We especially recommend the taking of the pulse rate as frequently as possible (preferably at least every five minutes) from the time the patient arrives in the laboratory until he leaves it; the graphic record of the respiration rate by means of a pneumograph around the chest or thorax; the graphic record of the presence or absence of external and visible activity during the experimental periods obtained from a pneumograph placed around the upper thighs; a graphic indication that the subject has been sufficiently awake to respond to a signal heard by him, *viz.*, a record made by means of a push button operated by the subject in response to an auricular stimulus frequently given.

We recommend that the subject remain in the bodily position he is to maintain during the measurements for at least one-half hour before the first measurement is begun (a recommendation repeatedly made in publications from this laboratory), and that both pulse rate and respiration rate be obtained during this time.

We recommend three periods of measurement of the respiratory exchange, whatever apparatus is used. The first period should be for practice, to make the subject acquainted with the procedure, and to allay his apprehension. When time is limited and the condition of the patient does not warrant a long enough stay for the regular procedure, the first observation period might be during the first half hour. The two additional periods should be made under the most careful conditions and only these two should be used as a basis of calculation or interpretation.

When the basal metabolism only is desired, it is an economic waste to attempt any other measurement than that of the oxygen absorption supplemented by the controls we have recommended. But when information is desired as to the metabolic effect of food or drugs upon an individual, the respiratory-valve apparatus and its accessories, adequate assistance

for the routine work, and a trained and reliable subject are the only conditions which can satisfy all the requirements of dependable scientific research.

#### SUMMARY AND CONCLUSIONS.

The respiratory exchange of 17 untrained medical students was measured with each of three breathing appliances, namely, mouthpiece, nosepieces, and mask, on two different respiration apparatus, the Benedict portable apparatus and a respiratory-valve apparatus. Each measurement with each subject was made in duplicate. To avoid influence of apparatus, six different orders of periods, so far as apparatus was concerned, were employed.

The results show that there are no marked differences in the respiratory exchange when the breathing appliance alone is considered. The breathing is slightly more normal with the mask.

The oxygen consumption is practically the same regardless of the breathing appliance or respiration apparatus used. The general trend of the oxygen consumption for the twelve periods, considered from the standpoint of time, indicates that there is practically no difference from period to period between 8.30 A.M. and 12.30 P.M. The general tendency for the metabolism to remain stationary is confirmed by the course of the pulse rate.

There is a slight tendency for the carbon-dioxide elimination to be higher with the portable respiration apparatus than with the respiratory-valve apparatus. This is due primarily to a tendency to a slightly greater ventilation of the lungs.

The average respiratory quotient with the portable apparatus is slightly higher than that with the respiratory-valve apparatus, and the lowest with the mask as compared with the mouthpiece and nosepieces. The general level of the respiratory quotient throughout twelve periods of measurement from 8.30 A.M. to 12.30 P.M. remains practically constant.

There is no indication that practice has any tendency to alter the course of the total metabolism as shown by the measurements of twelve successive periods on one day, and the results, in general, indicate that they are quite normal and can be considered as reliable.

When the measurement of the oxygen consumption alone is desired, the Bene-

diet portable respiration apparatus is the best apparatus for short-period measurement. When more data are desired, such as total ventilation, respiratory quotient, and mechanics of breathing, the respiratory-valve apparatus is better. For continued experimenting from period to period without interruption, the mask is preferable to the other two breathing appliances.

The average per minute values obtained with these 17 medical students in the post-absorptive state, at rest, and varying in age from 21 to 25 years, in weight from 51.1 to 76.1 kilograms, and in height from 161 to 190 centimeters, may be summarized as follows:

Carbon-dioxide elimination, 196 c.c.

Carbon-dioxide elimination per kilogram per minute, 3.12 c.c.

Oxygen absorption, 236 c.c.

Oxygen absorption per kilogram per minute, 3.76 c.c.

Respiratory quotient, 0.84.

Pulse rate, 64.

Respiration rate, 14.4.

Volume of lung ventilation, 5.87 liters.

Volume per respiration, 510 c.c.

Percentage of carbon dioxide in expired air, 3.45 per cent.

Percentage of oxygen deficit in expired air, 4.13 per cent.

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- <sup>20</sup> Benedict and Carpenter: *Carnegie Inst. Wash. Pub. No. 261, 1918, p. 203.*
- <sup>21</sup> Benedict and Carpenter: *Carnegie Inst. Wash. Pub. No. 261, 1918, p. 253.*

### Book Reviews.

*The Stereoscope in Ophthalmology, with Especial Reference to the Treatment of Hetero-*

*phoria and Heterotropia.* By DAVID WELLS, M.D., F.A.C.S., Professor of Ophthalmology, Boston University Medical School, Surgeon, Massachusetts Homeopathic Hospital, Globe Optical Co. 1918.

This is the second edition of this work and though having only 143 pages, is full of valuable information. After a discussion of binocular vision, the author gives his own methods of examining and treating muscular imbalance. Stereoscopic fusion training is described in detail and also a practical application of the phoro-optometer stereoscope with the author's charts. Other forms of treatment found useful are also given, as well as an account of the operative technique. The last chapter shows how scotomata may be mapped out in eyes lacking central fixation by Haitz's stereoscopic method or the phoro-optometer used with the Haitz-Bissell or Lloyd charts. Also Bissell's method of measuring the blind spot is given. The book is succinct and useful.

*The Diagnostics and Treatment of Tropical Diseases.* By E. R. STITT, A.B., Ph.G., M.D., LL.D. Third Edition. Revised. Philadelphia: P. Blakiston's Son & Company. 1919.

As this work dealing with "The Diagnostics and Treatment of Tropical Diseases" was thoroughly revised in the second edition, which was published less than a year ago, this third edition has not been changed to any great extent. The most important addition to this volume is the new material which has been added to the subject of trench fever, in the knowledge of which considerable progress has been made during the past year. Two new illustrations and a plate of malarial parasites have been added, and some changes have been made in various sections.

The book is divided into two parts, the first discussing individual tropical diseases, with especial emphasis on epidemiology and prophylaxis. Tropical diseases are classified as those due to protozoa, to bacteria, to filterable viruses, and infectious granulomata, skin diseases, and food deficiency diseases. One chapter includes a discussion of certain diseases of disputed nature of minor importance which cannot be classified readily in any particular group. Part two deals with the diagnosis of tropical diseases, and differentiates diseases by grouping them according to clinical manifestations rather than by treating them separately as individual diseases. This book presents the subject of tropical diseases in complete, compact, and accessible form.

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## VITAL STATISTICS OF ENGLAND AND WALES, 1901-1910.

ATTENTION has been called in previous issues of the JOURNAL to the present declining birth-rate in Great Britain. In comparing the present situation with previous years, the vital statistics of England and Wales for the years 1901-1910, which have been published in *The British Medical Journal*, are of interest.

The report of the Registrar General shows that the marriage rate per 1,000 single and widowed males, aged 15 years and upwards, which was 60.9 in 1861-70, fell to 53.6 in 1891-1900, and fell further to 51.6 in 1901-10. The crude birth rate, which was at its highest point in the decennium 1871-80—namely 35.4 per 1,000—had fallen to 29.9 in 1891-1900 and reached 27.2 in 1901-10. The legitimate birth rate per 1,000 married women, aged 15 to 45, declined rather faster than the crude birth rate and was, in 1901-10, 75 per cent. of the maximum value.

There is now little difference between the standardized birth rates of urban and rural counties. The difference between the contrasting groups, which stood at 2.46 per 1,000 in 1881-90, was 1.77 in 1891-1900 and only 0.57 in 1901-10. During more recent years, the rate of decline except in the Home Counties has been generally greater than before. The standardized death rate of 1901-10 was 16.6 per 1,000 for males and 13.9 for females, respectively 73.8 per cent. and 67.1 per cent. of the corresponding rates for 1841-50: the decline has been both relatively and absolutely much greater in the last decennium than during any previous period. Thus the male rate in 1881-90 was 20.0 and only declined to 19.5 in 1891-1900; the fall in the past decennium was nearly equal to the difference between the rates for 1891-1900 and for 1861-70. The improvement has been greater in women than in men. As a rule, the mortality rates have been lower in counties in which the greatest proportion of the inhabitants were in rural areas.

Between the years 1901-10, infant and child mortality has declined greatly. In 1841-50, the deaths under one year per 1,000 births were 153, and the same rate obtained in 1891-1900: in 1901-10, the proportion was 128. The mortality under age 5 per 1,000 living was 66 in 1841-50, 57.7 in 1891-1900, 46.0 in 1901-10. The remarkable fall commenced in 1902. Diarrheal diseases, tubercle, convulsions, and bronchitis are the causes of chief numerical importance in the mortality from which substantial reductions have occurred.

The death rates from all forms of tuberculosis and from phthisis declined 18.6 per cent. and 19.4 per cent. between 1891-1900 and 1901-10. In the fifty years from 1851-60, tuberculosis mortality has been nearly halved in males and more than halved in females. In the decennium 1901 to 1910, 304,141 deaths were ascribed to cancer or malignant disease, giving a standardized death rate of 867 per million, 13 per cent. higher than in the previous decennium. This and diabetes (the death rate from which increased from 77 to 93 per million) are among the few causes of death which show a rapidly increasing mortality. The rate of natural increase of the population in 1901-10 was very slightly higher than in 1891-1900 (11.8 per 100 against 11.7) and nearly as great as in 1851-60 (11.9), the declining birth rate having been compensated by the fall in the death rate. Dur-

ing the last few years, however, this has not been true, for the declining birth rate, even before the war, had become so marked that it was not compensated by the lessening death rate.

#### WAR ACTIVITIES OF THE UNITED STATES PUBLIC HEALTH SERVICE.

THE United States Public Health Service greatly assisted the prosecution of the war by carrying out war activities in several fields. The Public Health Report for June 6, outlining the work accomplished by this department, states that the first effort made was the formulation of a program, in February, 1917, which included the sanitation of ports and places within the United States in order to prepare them for camps of mobilization, concentration, or training for the Army or Navy, the sanitary supervision of mobilized industrial forces, medical and surgical relief to sick, wounded, or disabled soldiers and sailors at relief stations of the service, medical and surgical relief to mobilized industrial workers, laboratory operations, including both research and manufacture of serums and vaccines, and activity in the field of industrial hygiene.

In order to carry out these plans, there was established by Congress a reserve of medical officers, sanitarians, engineers, and other qualified experts in the Public Health Service. On June 30, 1917, the service consisted of 538 professional personnel, 1,506 other personnel, a total of 2,044. One year later, the professional personnel amounted to 1,472, and the total to 4,987.

In July, 1918, an order was passed bringing all Federal civil health functions under the supervision and control of the Public Health Service in order to secure more effective coordination. One of the first steps taken by the Service was the sanitation of extra-cantonment zones. A system of federal health supervision was established in and about zones surrounding military camps and important industrial centers engaged in war work. This work was greatly facilitated by the coöperation of the American Red Cross, and state and local health authorities. In some rural areas, the work consisted largely of measures designed to control the spread of malaria; in others, efforts to pro-

tect drinking water and insure a safe milk supply; in the cities, questions of sanitary housing, of the control of communicable diseases, and of industrial hygiene presented the chief problems. Men were vaccinated for smallpox and were encouraged to take the typhoid inoculation; barracks and bungalows were built; and medical and surgical relief stations were constructed in connection with industrial plants. Scientific research was carried on in the investigation of industrial fatigue, trinitrotoluol poisoning, the nutritive value of various kinds of flour and bread, dermatitis from mercury fulminate and parazol, antitoxin against gas gangrene, the administration of arsenphenamine, and other problems.

The increase in the production and use of serums, toxins, and analogous products involved an increased amount of work for the Hygiene Laboratory in the supervision of biological products. During the period of the war, 1,102,812 cc. of bacterial vaccine were distributed.

In discharging its duties in controlling and preventing the spread of communicable diseases, the Public Health Service realized its responsibility in organizing an effective campaign for the control of venereal diseases, and accordingly provided for the appointment of an officer in each state to direct the work of venereal disease control. During 1918, 22,441 cases of venereal diseases were treated in the extra-cantonment clinics.

In order to provide adequate medical and surgical relief, an order was issued by the President making all marine hospitals of the Public Health Service available for the treatment of the enlisted personnel and officers of the Army and Navy whenever such treatment was requested by the proper military authorities. Altogether, for the fiscal year ending June 30, 1918, there were treated at the United States marine hospitals and relief stations over 5,000 officers and enlisted men of the Army and Navy.

#### TETANUS IN BRITISH MILITARY HOSPITALS.

NINE analyses of cases of tetanus treated in British home military hospitals have been commented upon in previous issues of the JOURNAL. The tenth and eleventh analyses, which com-

plete the series, have been published in *The British Medical Journal*. The following table shows the number of cases of tetanus considered in the eleven analyses and the rates of mortality:

ANALYSES	NO. OF CASES	RECOV- ERED	DIED	MORTALITY PER CENT.
1 1914-15 .....	231	98	133	57.7
2 1915-1916 .....	195	99	96	49.2
3 Aug.-Oct., 1916 .....	200	127	73	36.5
4 Oct.-Dec., 1916 .....	100	69	31	31.0
5 Dec., 1916-Mar., 1917 .....	100	81	19	19.0
6 Mar.-June, 1917 .....	100	71	29	29.0
7 June-Sept., 1917 .....	100	85	15	15.0
8 Sept.-Dec., 1917 .....	100	84	16	16.0
9 Dec., 1917-April, 1918 .....	100	76	24	24.0
10 April-Sept., 1918 .....	100	74	26	26.0
11 Sept., 1918-Mar., 1919 .....	100	74	26	26.0

A diagram showing the ratio of the cases of tetanus to the number of wounded soldiers treated in home military hospitals from August, 1914, to March, 1919, shows an abrupt decrease in the ratio in November, 1914, probably due to the introduction of prophylactic injections of antitetanic serum. The fact that the incidence of the disease tended to become lower as the war went on may be explained by the fact that it became possible to administer earlier and more thorough surgical treatment. On the introduction of primary excision and primary or delayed primary suture, remarkable results were obtained. Complete and early excision of gunshot wounds was a potent factor in the prevention of tetanus. It is probable that in time, if the war had continued, tetanus would have been extinct as a war disease in the British Army.

The total number of cases of tetanus dealt with in these analyses was 1,426. The average incubation period in days for each of the eleven analyses in chronological order was 13.4, 31.2, 30.6, 45.0, 67.0, 44.1, 55.5, 46.9, 46.19, 68.5, and 54.8; the average incubation period for the whole series was 39.5 days.

In the tenth analysis there were 67 cases of general tetanus and 13 cases of local tetanus; the rate of mortality in the former was 29.9; among the latter there were no deaths. In the eleventh analysis there were 86 cases of general and 14 of local tetanus; the rate of mortality in the former was 30.2, and among the latter there were again no deaths.

In November, 1918, the primary prophylactic dose of antitetanic serum was increased from 500 to 1500 units. The value of the antitetanic serum has been undoubtedly established; but clinical and experimental evidence shows that immunity decreases within about

ten days. It was therefore decided that four prophylactic injections should be given to every wounded soldier at intervals of seven days. Figures are not yet available to show whether or not multiple inoculations result in the lowering of the incidence of tetanus among the wounded; but statistics indicate that the death-rate among those who contract tetanus tends to fall as the number of injections increases from one to five.

Interesting experiments were made in the administration of a double serum containing the antibodies of tetanus and gas gangrene; this was not successful in the prevention of gas gangrene, though the addition of antitoxins or other anaerobes seemed to have no effect, either good or bad, on the tetanus antitoxin.

In the administration of tetanus antitoxin, time is an important element. The opinion of the tetanus committee is that "in acute general tetanus the best method of treatment lies in the earliest possible administration of a large dose of antitoxin by the intrathecal route, repeated on the following day, combined with and followed on succeeding days by subcutaneous and intramuscular injections." In cases of acute general tetanus, large doses of serum produced the best results. *The British Medical Journal* observes that from analysis of the figures in the last two series of 100 cases treated in home military hospitals no case can apparently be made out either for or against the intrathecal route. In each of these two series one patient did not receive therapeutic treatment with antitetanic serum, and died. Of the 99 patients in each series who received this treatment, 74 recovered, and 25 died.

## MASSACHUSETTS STATE DEPARTMENT OF HEALTH.

MASSACHUSETTS was the first state in the Union to organize a State Department of Health. In 1849, an investigation was carried on by a legislative committee, which resulted, after a period of twenty years, in the creation of this organization. The fiftieth anniversary of the establishment of this department was observed at the State House on September 15 and was attended by many members of the profession who have been most active in public health work

in all parts of the country. Eugene R. Kelley, Commissioner of Health, presided over the meeting, and visitors were welcomed on behalf of the State by Governor Coolidge. Among the speakers were Dr. Henry P. Walcott, the commissioner of the department between 1886 and 1914; Dr. William H. Welch, director of the School for Public Health of Johns Hopkins University; Dr. A. J. McLaughlin, former State Health Commissioner and now assistant surgeon general in the United States Public Health Service; and Sir Arthur Newsholme, formerly chief medical officer of the local government board of England.

Some of the noteworthy achievements of the State Department of Health may be recalled with interest at this time. The purity of food and medicines has been protected after the enactment of the food and drug law: there have been established modern sewerage systems; the sanitary conditions on the Charles river have been improved, and the Charles River Basin has been built; a metropolitan water supply system has been created; the study of sewerage problems has been promoted by the building of the Lawrence experiment station; a laboratory for the distribution of diphtheria antitoxin has been established; and health districts have been organized throughout the State for the improvement of hygienic and sanitary conditions.

### MEDICAL NOTES.

#### SCANDINAVIAN CONGRESS ON PEDIATRICS.—

The first Scandinavian Congress on Pediatrics was held at Copenhagen on August 15 and 16. The classification and treatment of acute digestive disturbance in artificial feeding was one of the subjects discussed.

**CASUALTIES IN MEDICAL SERVICE.**—It has been announced recently by the Surgeon-General of the United States Army that 442 casualties occurred among the medical officers of the American Expeditionary Forces in France from July 1, 1917, to March 13, 1919. Of these, 22 died of wounds, 9 of accidents, 101 of disease; 46 were killed and 7 were missing in action; 4 were lost at sea. There were 36 prisoners unwounded, 47 wounded in action (degree undetermined); 93 severely wounded in action, and 72 slightly wounded.

**PROFESSORSHIP OF NEUROLOGICAL SURGERY.**—Dr. Ernest Sachs has been appointed professor of clinical neurological surgery at Washington University, St. Louis. This is the first case in which a medical school has recognized neurological surgery by creating for it a separate department.

**THE NURSE AND THE CAMPAIGN AGAINST CANCER.**—In a recent issue of *Campaign Notes*, the American Society for the Control of Cancer has emphasized the importance of promoting among nurses instruction regarding cancer. The Society has endeavored to secure the active cooperation of all nursing organizations, national, state, and local, of the leading training schools, and of individual nurses throughout the country. The Society has directed its efforts toward the provision of special instruction for pupil nurses and the actual participation of graduate nurses in the dissemination of the elementary knowledge of cancer among lay people generally, and particularly among women.

**TRUDEAU SANATORIUM.**—The thirty-fourth annual medical report of the Trudeau Sanatorium at Saranac, New York, including a medical supplement and Studies of the Edward L. Trudeau Foundation, summarizes the work which has been accomplished during the year. The war has not affected seriously the medical progress of the institution, for it has been possible to keep together practically the entire resident medical staff, because of the fact that most of its members have at some time been tuberculous. The clinical and x-ray work has been maintained as usual. The laboratory work has been somewhat retarded because of war conditions and the difficulty in obtaining suitable apparatus. Twenty-two physicians and medical students completed the course offered by the Trudeau School of Tuberculosis.

During the year 356 patients were treated at the sanatorium. Of 259 of these patients, 32 were discharged with the disease apparently arrested, 105 with disease quiescent, 34 improved, 41 unimproved, and 1 died. The condition of patients is recorded in tabular form in the Fourteenth Medical Supplement.

The following Studies of the Edward L. Trudeau Foundation are included in the report: "Teliotherapy in Tuberculosis," by E. Mayer, M.D.; "A Comparison of Physical Signs, Symptoms, and X-Ray Evidence Obtained in

Pulmonary Tuberculosis," by F. H. Heise, M.D., and H. L. Sampson; "A Tuberculosis Survey of the Residents of Saranac Lake," by F. B. Ames; "The Clinical Value of Complement Fixation in Pulmonary Tuberculosis Based on a Study of 540 Cases," by L. Brown, M.D., and S. A. Petroff; "A Glycerine 'Extract' of Tubercle Bacilli as an Antigen in Complement Fixation," by S. A. Petroff; "The Transfusion of Tuberculous Sheep with the Blood of Normal and Immunized Sheep, including a Study of Sheep Tuberculosis Controlled by the Complement Fixation Test," by E. Mayer, M.D., and D. J. Hurley, M.D.; and "A Study of Pulmonary and Pleural Annular Radiographic Shadows, together with Notes on Interlobar Fissures," by H. L. Sampson, F. H. Heise, M.D., and L. Brown, M.D.

MEDICAL SERVICE OF NATIONAL TUBERCULOSIS ASSOCIATION.—The National Tuberculosis Association will organize a medical service during the coming year. Dr. H. A. Pattison, Medical Field Secretary of the National Association, will be in charge of the entire service. The staff will include Mr. T. B. Kidner, formerly a member of the Federal Board of Vocational Education, and a public health nurse and medical field secretary.

TYPHOID MORTALITY RATE.—The seventh annual survey of the *Journal of the American Medical Association* shows that the number of deaths from typhoid has been decreased. The following table shows the mortality from typhoid fever per 100,000 of population in nine large cities:

	'18	AVERAGE '17	'11-'15
Chicago .....	1.4	1.7	8.2
Boston .....	2.5	2.9	8.0
Philadelphia .....	3.0	6.2	11.0
New York .....	3.7	4.0	8.0
Cleveland .....	4.7	7.1	10.0
St. Louis .....	7.2	7.5	12.1
Pittsburgh .....	9.8	11.2	15.9
Detroit .....	10.0	17.8	18.1
Baltimore .....	12.2	15.5	23.7

TYPHUS IN POLAND.—Two hundred American Army officers and men, forming a part of the sanitary mission being sent to Poland to fight typhus, are planning to travel through Germany by train as soon as equipment can be obtained.

THE TREATMENT OF HAY FEVER.—An article of interest and value to persons who suffer from hay fever has been published in a recent Public Health report. It is of primary importance to observe hygienic measures in controlling the disease. Homes should be selected in districts free from weeds, or if that is not possible, the Board of Health should be notified and the weeds cut down. Patients should avoid riding or driving in country abounding in weeds, and although exercise is beneficial, it should not be taken at the risk of increased exposure. Swimming, especially in salt water, is beneficial.

It has been discovered that rain deprives pollen of its toxic properties; a patient may therefore be protected by having the windows screened with the cloth saturated with water. When this method of screening is not practical, the patient may be provided with a special inhaling mask, based on the same principle.

The diet of hay-fever subjects during the hay-fever season should be light as regards food rich in protein, such as meat, fish, eggs, cheese, and milk; vegetables and fruit are beneficial. High seasoning and alcoholic drinks are injurious.

Surgical treatment may prove to be beneficial in cases having marked septal spurs, ridges, or deflections; and, although the percentage of cures from operations on these cases is not high (10 per cent.), they should not be overlooked in the prophylaxis of hay fever. Probably the electrocautery has been used more frequently than any other surgical method, but there are few cases which have been benefited by this treatment. Calcium chloride, calcium lactate, sodium bicarbonate, iodide, and mercury, have been found to afford some relief. Local treatment with menthol benefits some cases, but aggravates the attack in others. Nasal vibratory massage may be used for reducing the hypersensitiveness of the nostrils before the opening of the hay fever season and for correcting the intumescence of the nasal mucosa.

Experiments with pollen therapy have resulted in improvement in some cases, but better results are usually obtained by the combined use of pollen and vaccine therapy. Although the average results are satisfactory, this article points out that the number of seasonal cures may be considerably larger when the advantages of the preventive treatment of hay fever are better understood.



**RECURRENCE OF INFLUENZA.**—It has been reported that Health Commissioner William H. Peters of Cincinnati has expressed the belief that influenza will not recur in epidemic form this winter, although there will be some cases of influenza as there are every year. He believes that the nation has been to a great extent immunized, although the mortality rate may be expected to be high because any person whose resistance has been lowered may succumb to other diseases more readily. In order to protect these people, the American Red Cross, with the coöperation of the Board of Health, has established public health stations, where physical examinations will be made without charge.

**INFLUENZA IN MONTEVIDEO.**—A recent report from Montevideo states that in spite of the efforts being made by the Government and the Medical Association, influenza is still prevalent. The Uruguayan National Bureau of Hygiene is making plans for a Pan-American conference on influenza, and will invite the South American republics to send delegates to Montevideo in May, 1920.

**RED CROSS NURSES IN POLAND.**—The first detachment of American Red Cross Nurses who are being mobilized by the Polish ministry to teach American Health methods in Poland has arrived at Warsaw.

**NATIONAL COÖPERATION IN TUBERCULOSIS CONTROL.**—A bill has been proposed recently to create a division of tuberculosis in the United States Public Health Service, which would make possible government coöperation in the control of this disease. The returns of the United States Census Bureau for 1916, the latest figures available, show that tuberculosis caused 101,396 deaths in the registration district of the United States, a little more than 10 per cent. of all deaths. The draft examinations have shown the effect of tuberculosis as a factor in depreciating national power; of all examined, one in every twenty was found unfit for military service because of this disease. These facts show that there is urgent need for the National Government to take up the tuberculosis problem as an essential part of the reconstruction work.

The proposed bill not only establishes a new division, but provides for the creation of an advisory council for consultation with the

surgeon general of the service in regard to the scientific work to be inaugurated by the Service and the methods of performing it, and proposes that the present advisory board of the hygienic laboratory be abolished. It provides for an increase in the membership of the advisory board from eight to ten, and makes it possible for all branches of public health work to be represented on the board.

**ITALIAN MEDICAL ACHIEVEMENT.**—During the war, American physicians have learned to appreciate the greatness of Italy's medical achievement. The Ospedale Maggiore at Milan, for example, possesses an equipment for administering treatment by means of light which is probably equal to that of the St. Louis Hospital in Paris, which is regarded as the greatest hospital in the world for the treatment of affections of the skin. At Milan was founded the first hospital for foundlings. The Hospital for Occupational Diseases, the first of its kind, has been used as the model of similar institutions in this country. The laboratory of the University of Naples holds a leading place in work on kalaazar, the "black sickness" of India. It was this laboratory that first perfected the method of prophylaxis now used in typhoid. Genoa is a notable example of Italian preventive medicine and health education. Italy's medical schools, hospitals, laboratories, and methods of hygienic education indicate Italy's importance in the field of medical science, and are worthy of study by American physicians.

**CAUSE OF COLD FEET IN THE ARMY.**—The opinion has been expressed before the French Society of Biology that cold feet in the armies of the Allies was caused by the absence of sufficient vitamin in the food. It was observed that when vitamin substances are increased, this trouble disappeared.

**PATENT MEDICINE LEGISLATION.**—The House of Delegates of the American Pharmaceutical Association has passed a resolution recommending coöperation between the American Medical Association and the American Pharmaceutical Association in regard to the sale and manufacture of patent medicines. It is hoped that legislation similar to that which exists in Canada may be obtained to regulate patent medicines. The Fair Trade League proposition regarding

stable prices for standard commodities was re-indorsed by the House, and plans were outlined for securing federation of all state associations with the American Pharmaceutical Association.

## Correspondence.

### NURSES FROM THE WALTHAM TRAINING SCHOOL.

West Newton, Mass.

Mr. Editor:—

For many years it has been my privilege to recommend to patients the nurses educated at the Waltham Training School.

I desire to bear testimony that these nurses have given satisfaction; that, in my opinion, they are second to none in their devotion to their patients, in their adaptability to the demands of private nursing, and in their endeavor to be of real service in all ways in the homes where sickness and sorrow have entered.

To say that such nurses are unworthy to serve as Red Cross nurses or in any public capacity, or that they are ineligible to membership in any society of nurses is such an unreasonable position that it is almost unbelievable.

My understanding of the Waltham Training School is that the stiffness of the course, the character of the training, and the thoroughness of it are such as to place its graduates above any criticism, according to present-day standards.

It would, I think, throw some light on a situation that is quite unbearable if the authorities of the Training School or Dr. Alfred Worcester would publish the record of positions of responsibility in hospitals and training schools which have been and are occupied by its graduates.

My impression is that this would show very well that these nurses have had the best sort of training.

FRANK M. SHERMAN.

### RADIUM TREATMENT.

Boston, August 28, 1919.

Mr. Editor:—

The last two numbers of the JOURNAL have placed before your readers very interesting and valuable information on the use of radium as a weapon against disease in the hands of the surgeon. It would seem, however, that Dr. Greenough takes a much more conservative stand than does Dr. Bryant, but all must freely admit, yes, advocate, that in the use of so powerful a substance as radium, conservatism is of the utmost importance. And for the same reason, every bit of reliable information on this subject is of extreme value and should be widely published.

For several years, as a member of the radium staff at the Carney Hospital, and due to the courtesy of Prof. M. Douglas Flattery, the donor of the radium, the writer has had opportunity to test the efficacy of this powerful and mysterious element of nature along certain lines, and to such extent as the amount of the substance would permit, viz.: dermal and subdermal pathology as met with in warts, keloids, keratoses, naevi, localized acroin grouping (facial), obstructive scar tissue, moles, sessile indurations, rodent ulcers, and epithelioma.

As a result of such experience I am very glad to state that, excepting one case of the last mentioned group, so far as I know, radium has been one hundred per cent. perfect, though many of the cases have required persistent treatment extending over a period of some months.

I will speak briefly of two cases—that of the mentioned failure in the epithelioma, and one other because of its peculiar character. In the former, owing to my not knowing that radium should never follow the use of the x-ray, my attempt to treat an epithelioma on the cheek of an elderly woman only made matters very much worse, the malignant process spreading out in all directions and the unfortunate victim, after a trial of the methods advocated at the Huntington Hospital, left for her family home in Canada to spend the few remaining months she had to live. Had this case been treated in the beginning by radium, there would have been no question about her prompt recovery.

The second case was that of a girl of twenty with a good family history, and herself, barring the local pathology, in perfect health. For something over three years she had been the distracted possessor of a recurrent crop of eruptions on her chin. This colony made its appearances very regularly every three weeks, but had no association with the menstrual periods. The eruptive points, some of them the size of a small pea, averaged about twelve in number. Of the group a certain proportion would abort, as it were, while the others would go on to breaking down stage, emitting a muco-purulent fluid and drying up promptly, the process existing about nine days. Because of the patient's occupation—an actress—this sort of thing was very embarrassing for her, and she had gone to great expense at the hands of dermatologists in her efforts to cure the disease. Coming to my office one day with another member of her company whom I was taking care of for a trouble having nothing to do with the skin, she incidentally called my attention to her own disability, which, just at that time, was in a state of activity. I made an appointment for a week later, when I applied five milligrams of radium, screened, for one half hour, and that ended the matter, there having been not the slightest evidence of the disease thereafter.

It is very unfortunate for all concerned that the cost of this unique surgical instrument is so great, and we hope that the time will come when existing methods for its release from the ore—I note that one of the writers refers to it under the orthography of canotite (It was my impression that this matrix was named for a President of France—Carnot.)—will have been perfected to such a degree as to permit its sale at a reasonable figure so that the profession can make general use of radium. As it is today, however, it would seem well nigh indispensable in the hands of dermatologists.

JAMES BROWN THORNTON.

## Miscellany.

### SOCIETY NOTICE.

ESSEX NORTH DISTRICT MEDICAL SOCIETY.—The quarterly meeting of the Essex North District Medical Society will be held at the Wolfe Tavern, State Street, Newburyport, Wednesday, Sept. 24, 1919, at 2 P.M.

Dinner will be served at 2 P.M. Following the business meeting, these papers will be presented: Food Problems from a Hygienic and Economic Point of View, M. Victor Safford, M.D., of Boston, Past Assistant Surgeon, United States Public Health Service; and Food Problems from the Point of View of Administrative Control, William C. Woodward, M.D., of Boston, Health Commissioner of the City of Boston.

The next meeting of the Censors will be held Thursday, Nov. 7, 1919, at 2 P.M., at Hotel Bartlett, Haverhill. Applicants should present their diplomas to the Secretary at least one week before the date of meeting.

J. J. O'SULLIVAN, M.D., *President*,

J. FORREST BURNHAM, M.D., *Secretary*.

# The Boston Medical and Surgical Journal

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## The Massachusetts Medical Society.

### MEETING OF THE SECTION OF SURGERY, JUNE 3, 1919.

#### TREATMENT OF INFECTED BONE WOUNDS.

BY FREDERIC J. COTTON, M.D., BOSTON.

OF all the work of the reconstruction hospitals in the last year I have chosen to speak of the treatment of the septic bone conditions. First, because it has been, at its best, so good; second, because it is so eminently *the* contribution of military surgery in a field in which our civil practice has signally failed in the past; third, because there is danger that the successful methods evolved may not be applied to civil practice.

This is because part of the success obtained depends on active antisepsis in infected wounds—which in practice, so far, means a great deal of reliance on the Dakin solution and the Carrel technique.

Now, there are many leading surgeons who are necessarily no younger than is convenient. Otherwise they would not be leaders. They have been for years past accustomed to snort violently at any statement of the efficiency of antiseptics in wounds and this sort of thing be-

comes a reflex action very hard to correct, save in the young, even in the face of evidence.

We have often heard, are due to hear from many men again and again in the coming year, that the Carrel-Dakin treatment is no good. Mostly these are men who never really tried it or saw it tried under favorable conditions.

I admit that a mere knowledge of the Carrel-Dakin technique does not qualify a man to treat wounds, but I submit that only *with* this resource at hand, plus expert surgery, plus common-sense, plus organized industry, can one hope for results such as have been obtained in the most competent clinics in this war.

Remember that few hospitals overseas, outside Compiègne and DePage's clinics, have seriously attempted to deal with infections in this way.

This is no one's fault, but a necessary corollary of war conditions—but it does throw us back on our army hospitals on this side for the useful material to judge from.

I am going to try, therefore, to give you as good a notion of what has been done in this line in your own New England Hospital as I can contrive in a few minutes.

As you all know, the hospital, now known as U. S. Army General Hospital No. 10, is the outgrowth of the original idea of reconstruction



CASE 1.—On entry.



CASE 1.—After three months.

service first formulated here in Boston two years ago, and from the start it has been planned for reconstruction work, built for it, and equipped for it rather better than a good many such places. Moreover, I had expected to have just the sort of work that came, and the surgical division was very good to me in the matter of surgeons—as to quality.

Consequently, when it came to assignments, and when I put not my weakest but my ablest assistants on the septic end of the job, the pick was an unusually good team. This counts.

The head of the team was a young surgeon of good training and experience before the war, and had the advantage of the training of the Rockefeller War Hospital in the Carrel-Dakin technic. Next came an orthopedist, also with special training, adept at the handling of mechanical apparatus, so important to these cases. Then three picked young overseas men of experience.

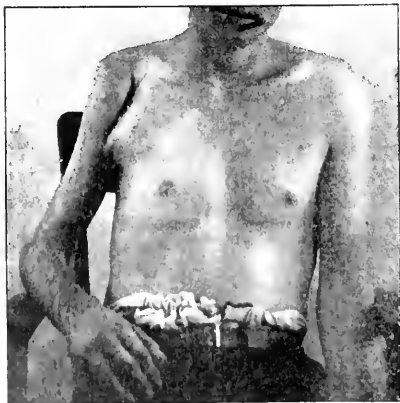
Picked nurses and orderlies and a real chemist in the pharmacy completed the team.

The septic ward held 50 patients at first, now 110 beds, with 40 to 75 patients under wound disinfection at one time.

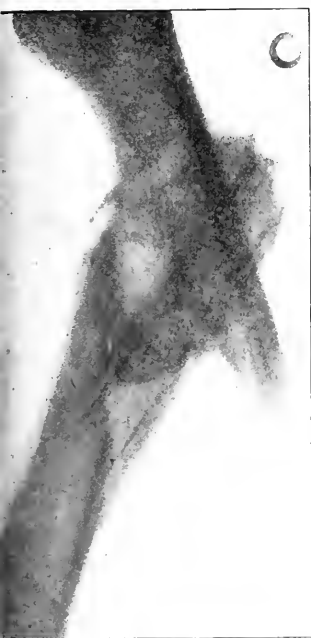
As should be the case in all hospitals, the septic side was kept absolutely separate—its own crew—its own operating room, operating kits, etc.

This had one drawback, from my point of view. Busied with clean operating, I felt justified in operating on the septic side only in the grave cases or for special reasons, though, as a matter of fact, these modern septic wards are so free of pus as to be almost safe.

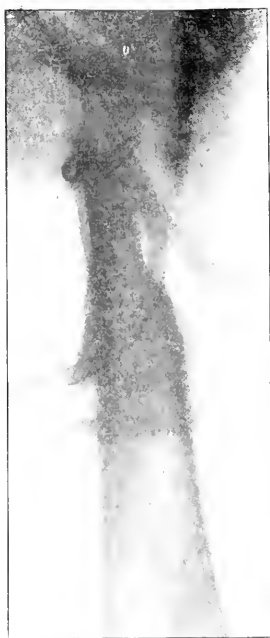
Now a word as to figures. Three hundred and forty-six cases have been admitted. One hundred and eighty-two operations have been performed. There has been one death,—an empyema, who came in in *extremis* and died before he could be operated on.



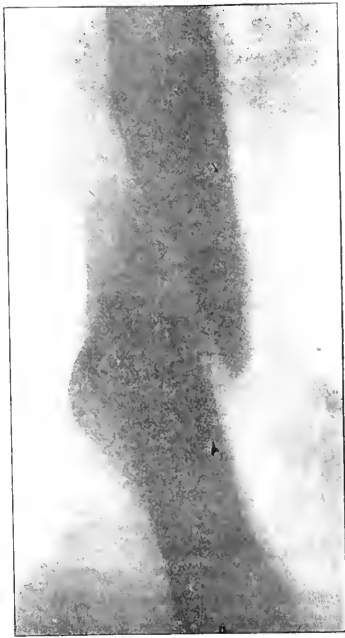
CASE 1.—After three months.



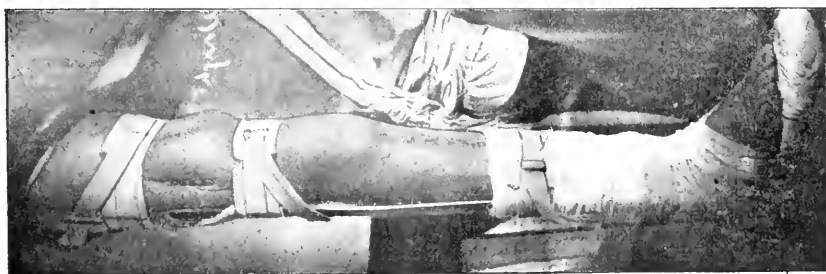
CASE 2.—Nov. 20, 1918.



CASE 2.—Dec. 18, 1918.



CASE 2.—May 4, 1919.



CASE 2.—After 48 months.

There have been two amputations, one for a secondary osteomyelitis after the cleaning operation. hopelessly crushed and stripped leg with a tation.

septic knee, one deliberately after the wounds had been healed, for a limb so badly damaged and paralyzed as to be worthless. There have been no reamputations. There have been no resections.

Except as noted, and for the cases now under treatment, all the 316 cases have been sent out of the ward healed and there have been only half a dozen cases returned, none of them for anything more serious than a few days' cleaning up. There have been no cases of sec-

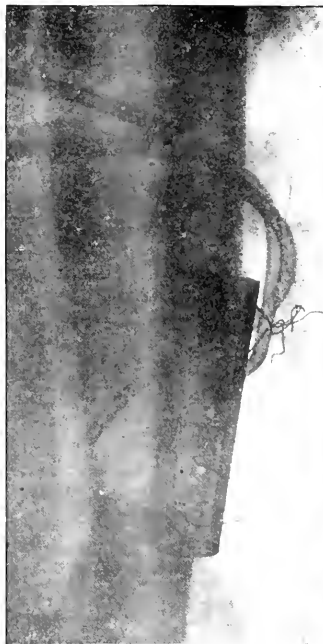
None of the cases under treatment is doing badly,—most of them doing admirably well.

Save for a few cases of post-operative sepsis and slough, due to accidents with latent sepsis in g.s.w. sears, the cases have practically all been wounds received between July 18 and November 11, 1918. They have been all sorts. Perhaps the pictures will give an idea of the sort of thing dealt with and the routine of results.

The case here shown (Case 1) wounded October 3, 1918, went through seven transfers be-



CASE 1.—April 2, 1919.



CASE 2.—April 21, 1919. With plate in place. Carrel-Dakin tubes also well shown.



CASE 3.—May 3, 1919. Plate out, consolidation beginning.

fore we got him, February 15, 1919. He had had Dakin treatment, but on arrival was in poor general condition with active sepsis. Six days later I did an extensive operation with removal of a lot of sequestra and the Carrel-Dakin treatment was begun. At two weeks the wound was clinically clean.

On April 3, at 40 days, the bacterial count was down to one per field. April 17, a little less than eight weeks, the wound was solidly healed.

X-Ray February 17, May 10, 1919; picture May, 1919.)

The next case (Case II), shot on guard duty, June 30, lay in a civil hospital, with a septic femur fracture, till November. When we got him he had great deformity and shortening, and severe local sepsis, and was in desperate general condition.

November 26, 1918, very extensive sequestra were removed and a very radical clean-up done. Owing to bleeding, the Dakin treatment was not used for a fortnight, and sepsis continued with slow improvement. On January 26, 1919,

the wound was reopened and the Dakin solution properly handled. The tubes came out early in March, and March 24 he was healed and solid.

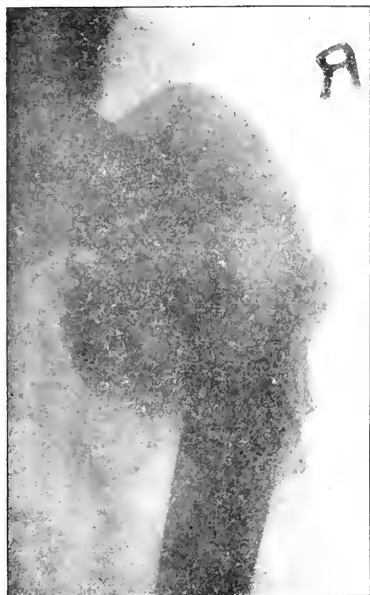
(X-Rays November 20, December 18, May 4, Photo May, 1919.)

The next case (Case III) similar, was one of the lost battalion, shot October 7, untreated for 36 hours. We got him February 5, with a very septic compound fracture, heavy overlapping, many pus pockets, and in poor shape generally. Sequestra removed February 14, and a quick clean up under Carrel-Dakin. April 8, operation to correct deformity,—bones levered into place and held to a new type of plate. Plate out at three weeks. Wound now small and closing rapidly. No bare bone.

(X-Rays April 2, 21, May 3, 1919.)

Case IV, compound fracture of hip, dating from October 6. Eight transfers before we got him, February 5. In bad condition, local and general; unusually anemic.

First operation a week after entrance. Sequestra removed from a huge cavity in and be-



CASE 4.—Feb. 6, 1919.



CASE 4.—May 3, 1919.

hind the femoral neck. There was, however, bony union. March 13, 1919, cavity closing reopened, simply to carry out Dakin treatment better. May 8, less than three months after the first clean up, the wound was closed, and is still closed.

(X-Ray February 6, May 7, 1919. Photo May, extension flexion.)

The next man, Case V, had been shot in August, received January 28. Had a solid union of the femur, but a sinus, and also involvement of the external popliteal nerve and toe drop. February 7 a sequestrum was removed with considerable debris, partly shrapnel fragments. Under Carrel-Dakin treatment he cleaned up so fast that the tube was out at three weeks and the wound solidly healed in less than seven weeks. The paralysis, as so often happens even in these late cases, recovered spontaneously.

(X-Ray February 5, May 8.)

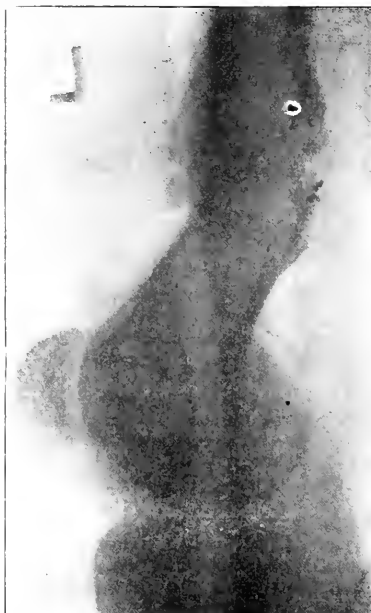
Case VI was shot November 5, reached us February 25 with his femur fracture united but with sinuses open on both sides of the thigh. Many and sizeable sequestra removed March 3, tubes out April 16. All wounds soundly healed on May 24.

(X-Ray February 27, May 2. Photo May.)

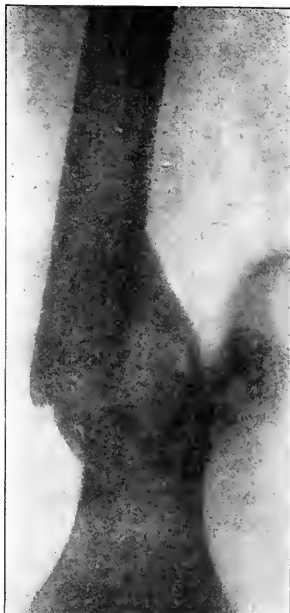
The next (Case VII) had 5 cm. of the tibia gone, gone since October 1. Operated on February 15. After five sequestra came out there was at the back little but a periosteal layer for two inches. Now shows a very small closing



CASE 4.—May, 1919.



CASE 5.—Feb. 5, 1919.



CASE 5.—May 8, 1919.

wound, no bare bone and union progressing at a great rate. Clinically, it is already pretty solid, and apparently is going to need no graft. It is three and one-half months since operation.

(X-Ray February 7, May 7, 1919.)

The next (Case VIII) is interesting as showing the clean-up of the secondary atrophic picture as sepsis is gotten rid of. He was wounded by high explosive September 5, admitted here February 20, had a large debris-filled bone cavity cleaned out March 10, and was all healed April 21, less than six weeks.

(X-Ray February 25, May 7, 1919.)

Case IX came in with osteomyelitis sinuses at both ends of the fibula, came in March 7, just four months after he was hit. Operation showed sequestra at the lower end, but elsewhere only subperiosteal pockets with a few small sequestra along a hugely thickened fibula. This was simple, the tubes were out and the wound showed only flat granulations in a month, though it took another six weeks to skin over.

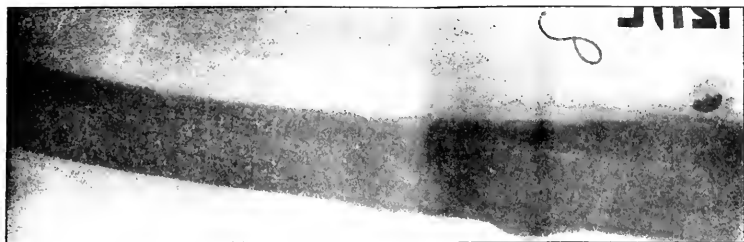
This wound (Case X) received in July, tore out the whole inner tibial head. He entered in December with a wide gaping wound and open joint. Under Carrel-Dakin treatment it

healed in, but only after four and one-half months.

Some of our cases were not handled by the Carrel-Dakin technic but on the basis of a practice I have used for years,—sterilization by 95% carbolic, alcohol, and bone wax plugging. This has its place in cases in which the cavity is well defined and can be cleaned to a firm wall and properly sterilized. In fracture cases it is not to be used unless firm and sufficient union is present. Bone grows faster under Dakin solution. But when it is indicated this is a very neat method and usually works, the wax being extruded slowly leaving the clean osteoid tissue behind it.

My associates cared little for this scheme at first, but now seem partly converted, partly owing to the enormous saving in labor to the surgeon and comfort to the patient if it works. It needs a bit of judgment and good technique. This case (Case XI) was so handled. Shot July 19; compound fracture tibia reached us in December. Operated December 30, very extensive cleaning of small sequestra and much debris out of a cavity that took two bottles of the army bone wax—well over two ounces.

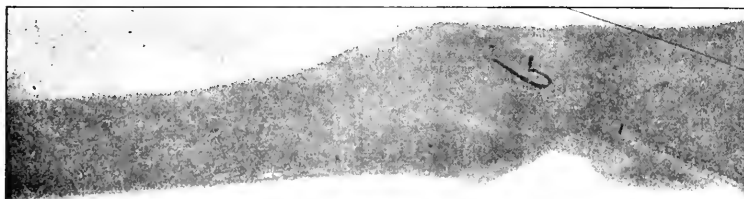




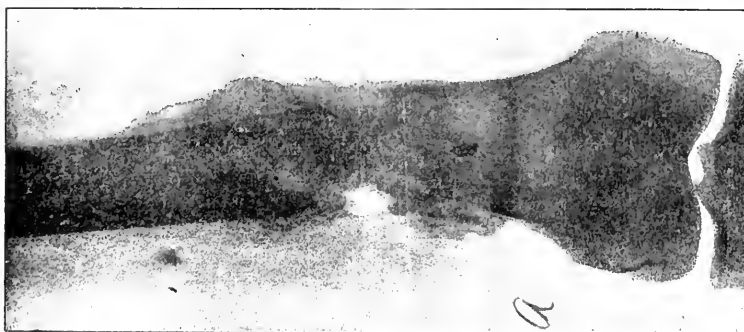
CASE 6, May 2, 1919, Side view.



CASE 6, Feb. 27, 1919, Side view.



CASE 6, May 2, 1919, Front view.

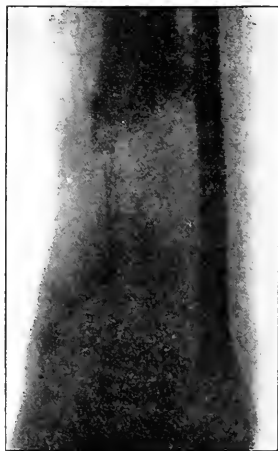


CASE 6, Feb. 27, 1919, Front view.





CASE 7.—Feb. 7, 1919.



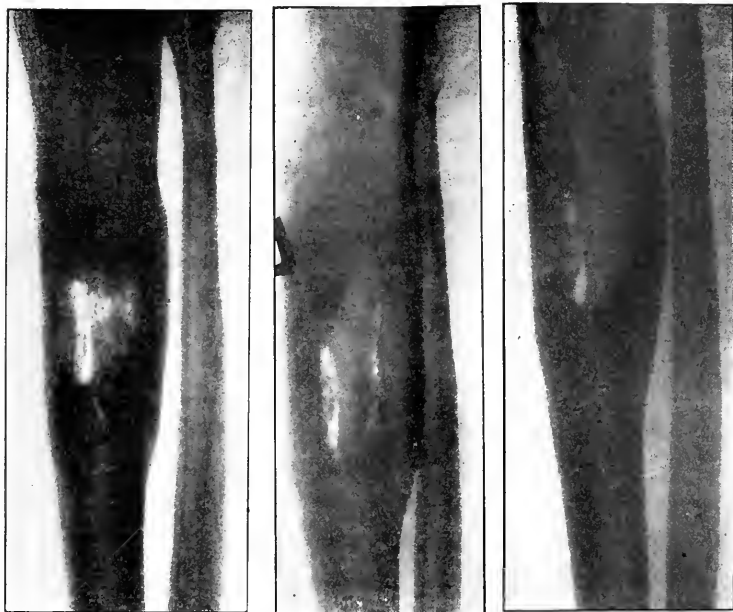
CASE 7.—May 7, 1919.



CASE 8.—Feb. 7, 1919.



CASE 8.—May 7, 1919. Note the disappearance of the secondary absorption changes in three months.



CASE 11.—Dec. 2, 1918. Before treatment. CASE 11.—Feb. 11, 1919. After sterilization and wax plug. CASE 11.—May 7, 1919. After healing.

Never had any more sepsis, up and about within a short time. Last of wax out at nine weeks and firm closure in four months.

(X-Rays December 2, 1918; February 11, 1919. Photo in May.)

This shoulder wound (Case XII) was similarly disinfected after removing a sequestrum, and then filled with bismuth paste. This came out in a month. Then ambulatory Dakin treatment; healed in a month more.

(Photo afterward, May, 1919.)

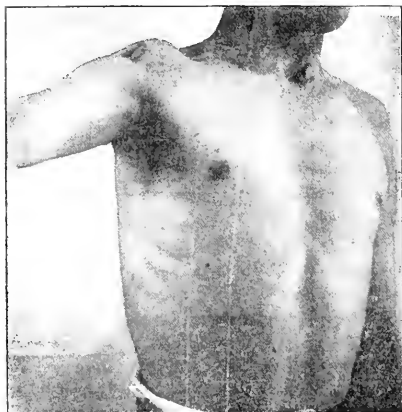
The next (Case XIII) was much the same. Wounded in the Argonne in September, came here in February, after a run of gangrene and sepsis. Sequestra removed from tibia, cavity cleaned and disinfected, filled with bone wax. Has gone on to full healing in three and a half months with the wax now all out.

(X-Rays February 12, March 13, April 4, 1919.)

Case XIV, old compound fracture of both legs was treated in the same way



CASE 11.—May, 1919. After healing.



CASE 12.—In May. After healing.

on both sides. On one side the wax came out after a week and it was then treated by Carrel-Dakin and nearly healed at six weeks. On the other side the wax stayed, as it should, for three weeks (this is right for a small cavity) and the wound was solidly healed at six weeks.

Case XV, a like case, was healed a bit dif-

ferently. The usual operation first, then Carrel-Dakin for a month until clean, then Bismuth paste, and later a paraffin and sesame mixture to fill the cavity. Solidly healed at four months. (X-Rays January 21, May 7, 1919.)

This last is a technique that takes the place of the often impracticable secondary closure. It is apparently ours, and seems to have a place,—again not without calling for clinical judgment.

Case XVI was handled in the same way,—cleaned out, cleaned up with Carrel-Dakin, filled with wax, after a month when the cavity was sterile, now solidly healed over, but only at three and a half months after operation.

(X-Rays January 21, May 7, 1919.)

This is slow, but these patients during this treatment are up and about without pain or sepsis, and with infrequent dressings.

We think this wax treatment purely protective, and have used various mixtures,—the government's pure wax, Luken's bone-wax, firm bismuth paste (No. 2) and a mixture of Captain Rice's of equal parts paraffin and oil of sesame. For cases waxed at the time of operation Luken's wax is best, for the later fillings I like Dr. Rice's mixture.



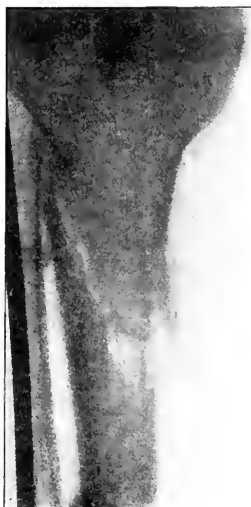
CASE 13.—March 13, 1919.



CASE 13.—March 13, 1919.



CASE 13.—April 4, 1919.



CASE 15.—Jan. 21, 1919.



CASE 15.—May 7, 1919.



CASE 16.—Jan. 21, 1919.



CASE 16.—May 7, 1919.



CASE 17.—Gap in bone covered by special technic.



CASE 17.

We believe the value of the method is a matter of protection, first against centripetal infection; second, against chilling and drying; bone so protected, if clean, forms osteoid tissue cleanly and fairly rapidly. The plates that come next illustrate this.

October 3 a young officer (Case XVII) had his leg shattered by high explosive and came to us February 14, with a wide-open wound in his tibia—an open trough out of which protruded spike-like bone ends above and below—behind, there was a bare ribbon of new bone, not continuous at that.

A clean-up operation was done February 25, with carbolic disinfection, after which the whole region was imbedded in a protective mass of

bone wax, under which the gap below and behind the spike ends proliferated up to the level of those ends, which in the meantime grew down closer to one another, remaining clean and healthy. They were then covered in, and are still covered by a two-stage skin and fat graft, and union is progressing under this. I know of no other way in which this could have been done.

(Photo, one x-ray.)

A few isolated points and I shall be through.

First, as to the one special class of cases of which Case XVIII is a specimen: had an in-



CASE 18.

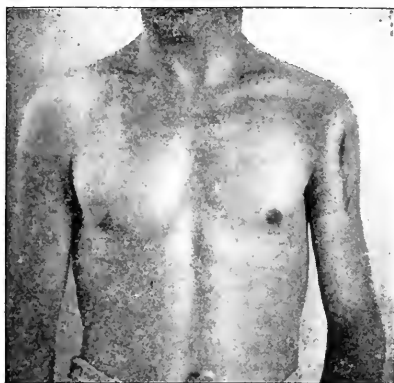
feeted bullet wound of the ankle October 26. He came to us just four months later, with an ankylosed joint, much pus, three sinuses. Despite operation and Carrel-Dakin he is not yet soundly closed but has occasional pus, apparently from a remnant of joint cavity. There have been two other cases, now healed, but showing for a long time a like trouble, and evidently we have something to learn about handling this type.

(Photo.)

Next, as to the behavior of grafts under Carrel-Dakin. There have been two cases in which grafts were lost. In one it was a pedicle graft from the tibia nearby; in the other, a free graft was set into the tibia in a case that seemed nearly clean. In both instances the graft seemed to have favored bone growth in the surrounding granulations before it came away, and in one, part of the graft stayed and grew under the conditions of controlled sepsis.

In two cases of bone graft in which there was extensive sear that sloughed, the Carrel-Dakin treatment controlled the mild sepsis so that the graft stayed clean and was covered in.

In a fourth case of real sepsis (staphylococ-



CASE 19.—Healed in six weeks. Compare, also, Case 12, a like case, healed in six weeks, without secondary suture.

cus) the same happy result was achieved in three weeks.

In a fifth case, non-union of the humerus, operated on four months after healing,—an abscess cavity was found at operation. The prompt resulting sepsis subsided under Carrel-Dakin, and the bone was covered with clean granulations in two weeks.

We have had little experience with flap and transplant work.

One pedicled flap helped, but sloughed in part. One free fat transplant and one pedicled fat-fascia filling were only partly successful. We believe this work can be better done than we have done it.

We have done comparatively few secondary suture operations, partly because we have been bone-waxing some cases, but mainly because we have found that after reaching the point where this procedure comes in question the wounds cicatrize so rapidly under Dakin solution that it is apt not to be worth while to operate.

In this point we have not followed the Rockefeller technique nor have we, in spite of our very radical operating, felt it necessary to open all wounds as wide as they do at the sacrifice of sound tissue.

To close, we believe that routine scientific treatment, as well coördinated as it has been possible to make it at No. 19, brings us to a point where infection in bone can at last be handled with precision and with a practical uniformity of result long desired, but never within our reach before this war.

#### DISCUSSION.

CAPT. ALLEN G. RICE, Springfield: I might say at the very start that we don't hold that this is the only way to treat these wounds. I think we all feel that it is merely a step towards the final method. It is certainly the best thing we have found yet, and I think it is going to have its place as progress goes on. It is surely going to leave a mark as a step in the final definite technique of the treatment of these bones. It is surely going to leave a mark whether the whole principle is accepted or not, and there are two points which I am sure are going to stay.

The first of these is in regard to the radical surgery which has to be done in these cases. It is not enough just to clean out what is wrong; we have to go way beyond that. The wound has got to be a large trough like a saucer or a basin. You can't have a cavity like a dentist's cavity in a tooth and expect to have it heal under Dakin's solution, because it won't; but if it is big enough it will heal fast.

The next point this method brought out is the absolute necessity of making every dressing of these wounds an aseptic procedure. This can be done very easily. You don't need to wash your hands between dressings. You can go right down the whole ward from one case to another, provided you have enough hemostats, and sterile gauze. Otherwise these wounds will not heal well; you can't get your bacteria count down, and you lose time. These two points are bound to stay whether the rest of the Carrel-Dakin method persists or not.

In these Carrel-Dakin cases there are two very important elements. One is Carrel and one is Dakin. Neither one does the trick; you have to have both. It is a combination treatment. Dakin worked out the solution of a definite strength, but if you don't have that solution made right and kept right you won't get results. On the other hand, if your solution is all right and you don't carry out the Carrel technique you won't get results. As to the solution of hypochlorite of sodium, it has to be made right. It is one man's job to make it for a hospital, and a quantity of 18,000 to 20,000 e.e. a day has to be made, and made right. One test is not enough; there must be more than one. It has to be of a certain strength and also of a certain alkalinity—two entirely different things. You can't test the strength and think the alkalinity is going to be right, and you can't test the alkalinity and take it for granted that the strength will be just right. We were very fortunate in having a first-class pharmacist who made the solution every day, sometimes twice a day, tested it as to its alkalinity and strength, and wrote the test down on a bottle, with the date, so that we knew we had fresh solution all the time, and knew it was of the proper strength

and alkalinity. This is a great help. The making of it is more or less tedious, especially testing it. You can't buy commercial tablets, drop them in water, and expect results.

The Dakin solution does something which no other solution seems to do. We tried salt solution and various other things, and while we kept the wound pretty clean, never got the bacterial count down, or as rapid healing as under the Dakin solution properly made.

It is very unstable, even under the best conditions. It always has to be in brown colored bottles and cannot be exposed to light. Direct sunlight causes it to deteriorate very rapidly. If left over one day we never used it up the next. Fortunately it is a very inexpensive substance to make. The ingredients do not cost much, and what you waste need not be figured in.

So much for the Dakin part. Now for the Carrel part. First of all is this radical surgery. The wound has to be opened up wide. It has to be made to look like a saucer or trough, with pretty extensive surgery, although we often found it could be done without a whole lot of mutilation. The principal thing is to get that shaped wound in the bone. You can push the muscles to one side and immediately after operation, if you pack the wound full of gauze and leave it for 24 to 48 hours before you start the Dakin solution, you find when you take the gauze out the muscles are out of the way. Of course Carrel was the man who worked out the principle of the tubes, and he worked it out on perfectly sound physical grounds, so that if you don't carry it out just as he planned it, you won't get results. It is obvious that no more solution will run out of one end of the tube than you put in at the other end; likewise, if you have a tube open at one end and tied off at the other end, with small holes on the sides for outlets, the solution will run out of a few holes, and none out of the other holes. Part of the wound will get the solution, and the other part won't. The tube made must be exactly as Carrel worked it out. There is a good, logical, reasonable explanation for every little fussy point he makes.

Then you must use enough tubes so that every bit of your wound gets solution. It does not do any harm if you use too much, except that it will run out on the patient and make him a bit uncomfortable, but it is harmful if you don't use enough so that the whole wound gets covered. It is easy to tell at the first dressing whether you have got enough tubes. When your first dressing comes off the whole wound should have a sort of a slimy appearance. If you find a certain area that is pretty bright red, that little spot was not getting the Dakin solution, and it won't heal. In three or four days you will find a little slough there if you don't get the Dakin on there pretty quickly.

As to the dressings, it was only exceptionally that we found we had to dress more than once a day. These tubes of course project out through the dressings, and each tube gets an instillation of Dakin every two hours, and that means night as well as day. If you skip an instillation you will notice it the next day when you do the dressing. It has to be done every two hours, and there is a definite reason for it. We used to start with continuous irrigation of these wounds, drop by drop, with the result that the patient was always saturated. Every two hours is just as good. The Dakin solution gives the bacteria in that wound such a kick that they don't recover in less than two hours. It is also better for the patient and does away with a lot of cumbersome apparatus.

Just at first it sometimes bothers the patient a little having the treatment at night, but after a while he takes it without waking up. The great majority of them don't wake at all when it is given, after the first two or three days. In fact, it was quite a common complaint to have the patient tell you that he did not get his Dakin in the night.

The man who does the operating ought to do the dressings. The results are not so good if he does his operating and then hands the cases over to somebody else, because every one has a little different way of doing these things. The man who operates knows where he wants the tube to go, and it is hard to tell somebody else just how to do it.

If you can get up some team work with this technique you will get along faster. With team work it is very easy to go right down a ward and do 25 or 30 dressings in two hours. Each one knows just what to do, and does it, and then the nurse comes around and pours the Dakin into the tubes. The team work is a great help. Otherwise the dressings become rather tedious affairs.

There are four definite principles which govern the whole treatment. The first is radical surgery, which we can call the mechanical cleansing, opening up all the places and getting out all the dead tissue. This is followed by chemical cleansing by the use of Dakin's solution. We control the wounds by making bacterial counts. Just at first it is useless to make bacterial counts, because the wound is full of bacteria anyway, but when the wound begins to look fairly clean then it is time to take these counts. Sometimes you have awfully nice, clean looking wounds which you would swear were sterile, and the count is from 60 to 100. Anything over 50 we call infinity; one bacterium in five fields, we call surgically clean. These wounds can be sutured and they heal by first intention.

In the past cultures were made from all of these wounds, because it was thought they might have streptococci, but when



they found that if the count got down as low as one in five fields, there were no streptococci or gas bacilli. We do not close a lot of them, because it means giving the man ether again, sewing up his wound, and taking stitches out in anywhere from a week to ten days. We found that if it did not suture, the wound would heal in about the same length of time, so what was the use of taking a chance that you might reinfect it? We decided that it was just as well to let them heal themselves.

One other thing which I wish to speak about is the scars of these wounds following the use of Dakin treatment. Invariably whitish, tough-looking things, they are thin and they stretch. We had one man with a very bad wound back of the shoulder, who came to us with his arm tied down just by scar tissue. After we took him in hand and gave him the Dakin solution it formed one of those nice, pliable scars in a short time, so that he could put his hand to the top of his head, which he had not been able to do for some time.

Of course there are certain disadvantages to this method which can never be overcome. In the first place, it is awfully fussy, but if you once get the thing running right it runs itself. Then, too, the solution, of course, is unstable and won't keep, so that it ought to be made freshly every day. In the next place, doing it day by day, the dressings do get rather tiresome. There are some mornings that you don't think you can possibly get around, but after you look at the wounds and see how nice they look your enthusiasm comes back and you get at it. From 20 to 25 were the average number of dressings we did on each case.

Another disadvantage is the skin irritation. Dakin's solution is not irritating in a fresh wound or in a wound that has been having it, but seems to promote healing. However, it does attack normal skin around the wound, and that has to be protected. Of course if it is properly protected you won't often get this irritation. Of our 300 cases we found just one man whose skin would not stand it in spite of all kinds of precaution. We found all kinds of skin, from the tough, heavy kind up to the light-haired, freckled-face young fellow whose skin blistered when he went out in the sun. This one man gave us a great surprise, because he looked as if he had a good skin, but Dakin caused a terrific dermatitis, and we had to stop giving it.

The advantages of this method far outweigh the disadvantages. In the first place, the patients were comfortable in spite of these great wide open wounds. They are even glad to have you come around and dress them, because it doesn't hurt. It seems marvelous when you get all through and the patient says it did not hurt him at all. I never saw anything else used in wounds which made them so painless. We had all kinds of mentalities, too.

At the first dressing they did complain a little bit, but after that there was no complaint. The wounds are so clean it is a joy to look at them. You don't see any pus in any of them. They are clean except for a rather slimy stuff which is not disagreeable at all, and there is no odor. We had a ward full, at least fifty men, and there was none of that septic smell that we are so familiar with. There was a good clean smell all around the hospital. From the Dakin solution you get only that faint odor of lime which is not at all disagreeable.

The wounds certainly heal faster than I have ever seen them before. You can almost see them grow from day to day. We are no longer afraid of making a tremendously long wound for fear that it will be a long time healing. The wound has got to heal from the bottom, or you will be in trouble at the end. Sometimes it is quite a different problem to keep the sides from healing first. The skin should be scraped off if it is growing too fast, so as to let it heal up from the bottom. The same is true with the bone cavities.

Dr. Cotton and I had quite a little friendly argument as to which was better, the wax or Dakin's. I think that every case is not suitable for the wax, and I have not yet seen the case which is not suitable for Dakin's solution.

DR. C. W. PEABODY, Boston: I have listened with a great deal of interest to the paper this afternoon, because I think I understand how much time and investigating it must have meant for Major Cotton.

I perhaps can speak from an unprejudiced standpoint, because I am a convert to this method from a prejudiced point of view. I started in about three years ago, in France, trying out the Carrel-Dakin technique, when at the time, at that particular place, we used any kind of tubes with holes in the sides, with a sodium hyperchloride solution called Eusol. This was too caustic and very irritating. Results showed at first a very encouraging outlook for the immediate sepsis, and then no further result in closing up the wounds. I had an opportunity before leaving to see the technique in one of Carrel's own hospitals carried out accurately. I think it is true that, in connection with the war work we have more conveniences and more time in this country to do the necessary painstaking technique.

I think it would be interesting for the Society to understand a little more fully the type of the cases we have received at No. 10. They are old wounds with some union, a callus which is very large to external examination, partly fibrous and bone, considerable quantities of very foul pus, frequent constitutional reactions of fever, etc. This callus will often be honey-combed with absorption areas of bone. These men probably got a very good clean-up to start

with, but in their transportation, etc., the wounds have been allowed to close up too soon. Those, I think, represent a more serious problem than the osteomyelitis in civil practice. It seems to me very striking, and absolutely true, as Major Cotton says, that there is no secondary osteomyelitis following this method. That does not mean that no patient has had to have a second operation, because sometimes there was a little cavity in this fraction of the callus where there was some small sequestrum, but the bone that had been cleaned out at the time of operation had stayed healthy.

There is another important point which is worked out in this treatment, and that is the absence of secondary reactions after operation. Instead of seeing a very high temperature for the next two days, with local pain, that is pretty nearly absent. I have found that to be aided a good deal by inserting at the time of the operation Carrel-Dakin tubes packed with gauze and beginning instillation early. The result is that you get the jump on the secondary infection before it has had time to spread into the surrounding tissues. Sometimes you cannot stop the oozing and therefore you simply have to pack solid with gauze and leave it in, and these cases have always shown more painful dressings in comparison, and more general reaction. Of course the Dakin cannot be started immediately because of the neurolytic action of the Dakin solution.

In the subject that Major Cotton has presented on the short cut, or the bone wax idea, I was very much prejudiced against that, but had to modify my stand a good deal; but, as he has pointed out, those cases have to be selected.

After phenol cauterization and bone wax all that results after the operation is a thin serous discharge until the wax is finally extruded by the new tissues filling up the cavity. On the other hand, a cavity, partly bony and partly fleshy, suppurates and extrudes wax very easily. I think the explanation for that is to be found in the sterilization process which takes place in a wound with pure phenol, yet without danger to the patient, because it will coagulate, and not be absorbed. When you are dealing with soft tissues, coagulation prevents sterilization of the channels in the soft tissues, which are not immediately reached by the solution as soon as it strikes the wound. That type of wound we packed with bone wax, and it loses it much more quickly.

The secondary suture problem is a rather difficult one, applied to this particular type of case. You are bound to get quite a large scar, which generally results in difficulty in making the two sides of the wound meet. You expose, by dissection, a considerable area which may not be sterile, and secondary drainage may have to be adopted. I note that Hawley started out with 80 per cent. of failures, and came out with

about the same percentage of successes. The difference in results was probably due to the selection of cases, in a great measure.

Major Cotton brought out one case which I think was very interesting. The patient came to my ward suppurating after a bone graft for non-union which had not had sufficient time to become aseptic before secondary operation. There was a large area of exposed graft. We went to work with the Carrel-Dakin tubes and closure started right away. The infection was a staphylococcus aureus infection, yet in two weeks the wound was superficial and healing perfectly.

DR. J. E. GOLDTHWAIT, Boston: In the first place, of course the Carrel-Dakin solution which has been described is undoubtedly the best method of sterilizing these wounds if you can control the conditions, but it is a very difficult method to use and its success depends absolutely upon the technique. It is really useless to turn a method of this sort loose upon the profession for general use in the wards unless you have someone who is checking it up all the time. The percentage of difference between its being harmful and useful is extremely small. The solution is unstable; that is the secret of its efficacy, and for that reason we should pay no attention to those so-called solutions that are stable. They are absolutely of no use.

If you can control your technique, the Carrel-Dakin method is unquestionably the best method you have for sterilizing these wounds. If you cannot, then don't fuss with it at all. Give it up entirely, and go back to the plain yellow soap solution, which is one of the best things you can apply. When you analyze it, there is a reason for it. Your harmful organisms will not grow in a strongly alkaline solution.

Some of the worst cases I saw were in the winter of 1917, on the British front, and these were treated entirely with plain yellow soap solution. It is one of the best dressings that you can use, but of course when you can control your technique, without any question, the Carrel-Dakin is the best we have.

It seems to me that in regard to the wax, the men should go away from here clearly understanding that the principle of the wax is all right provided you have sterilized your wound first. If you have not sterilized your wound, you will have the same result with wax that we did a dozen or more years ago, coming to other methods simply because it was difficult to cleanse your wound. If you are going to use wax, open your wound wide and don't be afraid.

DR. LINCOLN DAVIS, Boston: There is one question I would like to ask in regard to bone wax, which I have not seen used. Where you have a large cavity in the bone can you coat it while that cavity is closed? I am not quite clear what the mechanical process is of the closure of that cavity.



FIG. A.—Photograph, lateral view. Camera placed in position of x-ray tube.

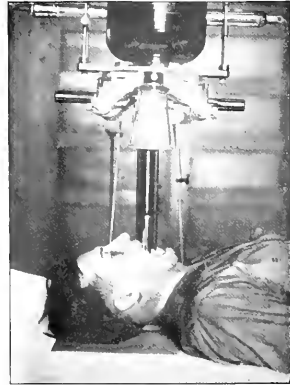


FIG. B.—Antero-posterior view, showing distance and position of head.



FIG. 1.—A skeleton that has been disarticulated and then articulated and x-rayed in lateral position (not a true lateral position).



FIG. 2.—Same. (True lateral position.)

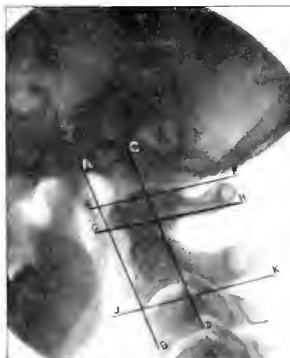


FIG. 3.—Normal lateral view, showing lines drawn to illustrate method.



FIG. 3a.—Same case as Figure 3. (1) Anterior portion of posterior tubercle of atlas; (2) anterior portion of spinous process; (3) anterior tubercle of atlas.

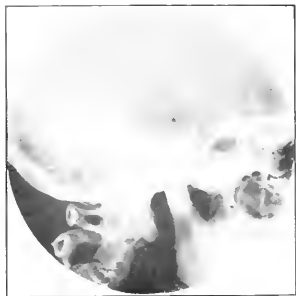


FIG. 3 b.—Plate made to show the posterior arch. (Not a true lateral.)

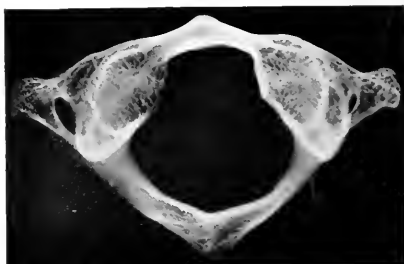


FIG. 3 c.—X-rays of the atlas, axis, and 3rd cervical vertebra in the same diameter to illustrate the difference in size of the spinal foramen between these three vertebrae.



FIG. 3 c.

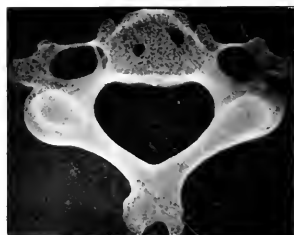


FIG. 3 c.

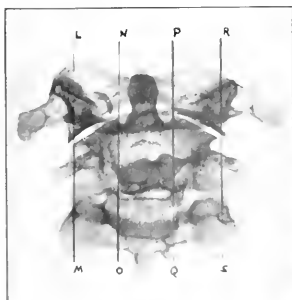


FIG. 4 a. Articulated skeleton. It is impossible to articulate perfectly these three bones in the specimen.

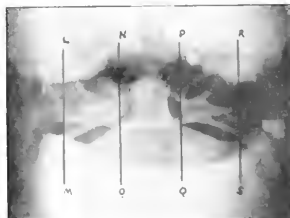


FIG. 4. Antero-posterior view, with lines drawn on plate of a normal living case.

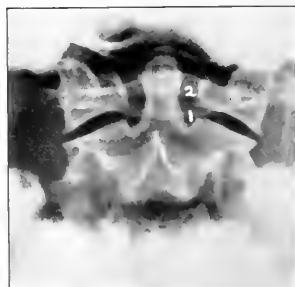


FIG. 4 b. Normal living case. (1) Outline of posterior arch; (2) outline of anterior arch. To differentiate, note that the posterior arch in outline continues and merges with the transverse process. Also note the clear space between the articular process of the atlas and axis.

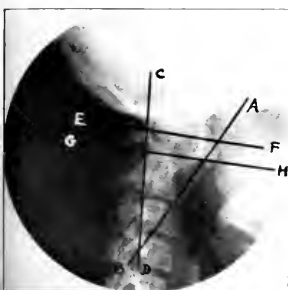


FIG. 5.—Forward dislocation of the skull, atlas, and axis, with lines drawn. (Compare with Fig. 3.)



FIG. 6.—Forward dislocation of the skull, atlas, and axis, on the 3rd cervical vertebra, with a fracture of the lamina of the axis. Note that whether the actual fracture can be seen or not, the anterior portion of the posterior tubercle of the atlas is anterior to the anterior portion of the spinous process of the axis and the spinous process of the axis is anterior to the spinous process of the 3rd cervical. (Compare with Fig. 3 or 3 a.)

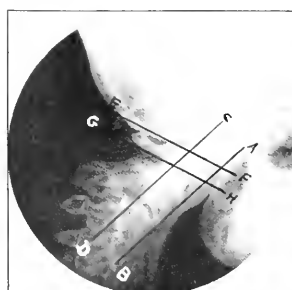


FIG. 7.—Lines drawn to illustrate method—same case as Fig. 6.



FIG. 8.—Luxation of skull and atlas on axis due to a destructive bone disease of body of axis (new growth). See Fig. 8 a.

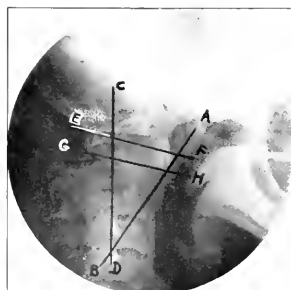


FIG. 8 a.—Same case as Fig. 8. Lines drawn to illustrate method.



FIG. 10.—Probable fracture of one portion of the posterior arch of the atlas. (The writer is indebted for the loan of this plate to Dr. Paul F. Butler.)



FIG. 9.—Fracture of posterior arch of atlas. (Compare with figures 4, 4 a, 4 b.)

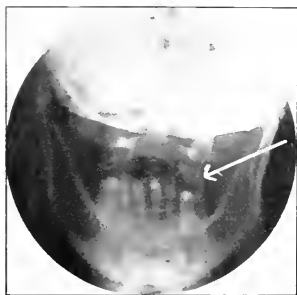


FIG. 11.—Forward dislocation without fracture of the skull and atlas.



FIGS. 12, 13, and 14.—Congenital malformation converting the vertebral groove into a complete and partial foramen.

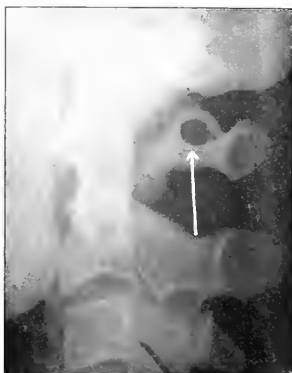


FIG. 13.



FIG. 14.



FIG. 15.—Partial dislocation of the skull, atlas, axis, and third and fourth cervical vertebrae with a crushing of the body of the fourth vertebra.

DR. A. P. MERRILL, Pittsfield: I would like to ask Major Cotton a question. Do you first sterilize these cases by pure carbolic and alcohol? If so, does that not form a film of cauterized bone tissue through which the new bone tissue has got to work? Do you rely on the throwing out of bone tissue at the edge, or does it come also through this film of cauterized bone?

DR. FREDERIC J. COTTON (answering Dr. Lincoln Davis): I think the original scheme, as Dr. Goldthwait knows, was to use it as a substitute for bone, to pack up cavities which are left with wax in them, just as the fatty transplants. That did not work out very well. It never worked out with me. For a good many years I have used bone wax on the basis that it would be eventually extruded. It is gradually pushed out of the wound, and it leaves behind it a bed of granulation tissue, so that eventually you get your bone filling in. I have no right to say that the granulation tissue is necessarily osteoid. The cavity, when the thing was entirely healed, did not show lime salts by x-ray. Calcification of the whole cavity perhaps was never completed.

I do not feel that I want to use this method where there is not a sufficient cross section area outside to carry the weight. But on the whole, it represents simply a more certain and very much more comfortable way of doing things in this very selected and rather narrow type of case. The process is one that really belongs to chronic osteomyelitis rather than in these war cases.

DR. FREDERIC J. COTTON (answering Dr. Merrill): I pay no attention to the periosteum at all. I do not think there is any doubt but that you get a thin film of cauterized bone after you have sterilized. You put in crude carbolic for one and a half to two minutes by the watch. It is a question of not being afraid of carbolic, and you get a very easily demonstrated film on your soft parts. What does happen is that the granulation tissue goes up through that film, and it doesn't make any difference.

DR. COTTON (closing the discussion): I will just say in closing that we were working in a "repair-shop" hospital to clean up the cases, and had nothing to do with the battle-front work. There was perfectly wonderful work done there in the salvage cases. Ours were very late cases, and represented a practically definite, limited class of cases. I have presented them, not because they represent such a large share of the war work, but because they are very closely parallel to the civil problems. We do get a lot of these same cases in civil practice, which we happened to have the opportunity to familiarize ourselves with under war conditions.

## A METHOD FOR MORE ACCURATE STUDY OF INJURIES TO THE ATLAS AND AXIS.

BY ARIAL W. GEORGE, M.D., BOSTON.

The following study of injuries to the atlas and axis, and the didactic method used, is the result of instructing medical officers for x-ray service at the Medical Officers' Training Camp, Fort Riley, Kansas, where it was found necessary intensively, and in the shortest possible time, to review the cervical region as well as all other parts of the body.

It was found in the beginning that the mere demonstration of x-ray plates did not suffice to make any very permanent impression upon the students and that their learning became a matter of mere imitation and was soon forgotten.

As the various classes came through the school, the method about to be described gradually unfolded itself. The principal object of this method is to leave with the students some fundamental facts: 1st, the study of the anatomy; 2nd, the variations from the normal.

The writer claims no special originality for the method and is indebted to the medical officers who were students and to the various instructors who throughout the time the school was in operation helped teach and suggest better methods of teaching. I am particularly indebted to Lieut. Harold Swanberg of Chicago, Ill., for his help on the subject.

### NORMAL ROENTGEN ANATOMY OF UPPER CERVICAL REGION.

1. *Lateral View.* Before an interpretation can be made of the upper cervical region one must determine that the plate under examination has been taken in a true lateral position (See technique). This can best be determined by the position of the rami of the mandible. It is not possible exactly to superimpose the rami, though there should never be more than one centimeter's difference between the two. (See Figure 1, not a true lateral; Figure 2, a true lateral.)

In the true lateral position, an imaginary vertical line can be drawn along the anterior surface of the bodies of the cervical vertebrae (See line AB, Figure 3); also a similar line can be drawn, parallel to this line, along the posterior surface of the cervical bodies. (See line CD, Figure 3.) While these lines will not

hold good for the entire cervical region, for the purpose of diagnosis they are essentially true for the upper cervical region. In well developed male subjects, the anterior tubercle on the anterior arch of the atlas is frequently quite large and will project slightly anterior to the line drawn along the anterior cervical bodies. An imaginary line can also be drawn from the superior border of the anterior tubercle of the atlas to the superior border of the posterior tubercle. (See line EF, Figure 3.) It will be approximately parallel to a similar line drawn from the inferior border of the anterior tubercle to the inferior border of the posterior tubercle. (See line GH, Figure 3.)

Within the rectangle formed by lines AB, CD, EF, and GH (Figure 3), there is normally noted an increased density of bony structure. This is due to the fact that the lateral masses and transverse processes of the atlas, and the odontoid process of the axis are superimposed, and all lie within this area.

The area within the parallel lines EF and GH (Figure 3), posterior to the rectangle above mentioned, comprises the posterior extremities of the lateral masses and the posterior arch of the atlas, including the posterior tubercle. The relation of the posterior tubercle to the base of the skull varies, rarely being more than one centimeter from the base of the skull, except in congenital malformation. In a true lateral view each side of the posterior arch of the atlas should appear superimposed. If both sides of the posterior arch can be directly seen (Figure 3-B), it is positive proof that the atlas was not taken in a true lateral position, and without other sufficient evidence, injury is not to be considered. The posterior part of the posterior arch appears to project slightly upward. This is due to the fact that the anterior part of this same arch is flattened from above downward, due to the groove for the vertebral artery. (See congenital malformations.)

The posterior tubercle of the atlas is on a more anterior plane than the posterior extremity of the spinous process of the axis, but the anterior part of the posterior tubercle is never normally on a more anterior plane than the anterior part of the spinous process of the axis. This is due to the fact that the vertebral foramen of the atlas is larger than the corresponding foramen of the axis. (See Figure 3-C.)

The only apparent exception to this will be the congenital malformations of the atlas. (See congenital malformations.)

The retro-pharyngeal structures form a vertical line parallel to the anterior aspect of the cervical bodies. The uniformly dark area anterior to this represents the lumen of the pharynx.

An imaginary line can be drawn from the lower border of the body of the axis to the lower border of the spinous process of the same vertebra. (See line JK, Figure 3.) It is approximately parallel to the line drawn from the lower border of the anterior tubercle of the atlas to the lower border of the posterior tubercle. (Line GH.) In the rectangular space above the line JK, is the greatest part of the axis. The upper half of this area shows an increase in density of bone due to the lower part of the lateral masses of the atlas, the superior articular processes, body, and part of the odontoid process of the axis. The lower half of this rectangular space shows the body and transverse processes of the axis superimposed. The area posterior to the above rectangle, and between the lines GH and JK, contains the inferior articular processes, laminae and spinous process of the axis.

Normally there is no break in continuity in the upper and lower borders of the laminae of the axis. The anterior portion of the spinous process of the axis is always on a more anterior plane than the anterior part of the posterior tubercle of the atlas.

2. *Antero-Posterior View.* In an antero-posterior view of the upper cervical region, imaginary vertical lines can be drawn from the lateral and median margins of the lateral masses of the atlas (See lines LM, NO, PQ, and RS, Figure 4), passing through the lateral and medial margins of the superior articular processes of the axis and are approximately equally distant apart. The odontoid process appears in the central portion of the two median lines.

The hyaline cartilage on the inferior articular surface of the lateral mass of the atlas and the superior articular surface of the axis is of uniform thickness on each side, thus resulting in an apparent clear space on each side, since they offer no obstruction to the roentgen ray. The posterior arch can be recognized by a continuation of the shadow of the arch with the trans-



verse processes, and as it is in closer proximity to the plate than the anterior arch, it is more clearly seen on the plate. The anterior arch may be occasionally recognized, and can be demonstrated by its conjunction with the spongy bone comprising the lateral masses (See Figure 4-B). In the average case the apex of the odontoid process projects just above the shadows produced by the arches. From the roentgen standpoint, the superior articular surfaces of the axis are more or less flattened, or even slightly concave, and the inferior articular surfaces of the atlas are slightly concave. The body of the axis is of uniform density and structure, excepting in the median line, where we can sometimes see the shadow of the bifid spinous process of this vertebra.

#### PATHOLOGIC ROENTGEN ANATOMY OF UPPER CERVICAL REGION.

1. *Lateral View.* One of the most important observations that can be made of the pathology of the osseous system is the loss of the normal curves by the formation of acute angles. Injuries, destructive bone diseases, etc., will be early recognized by the formation of these angles (See Figure 6): this is particularly true of the vertebral column. In the interpretation of injuries and diseases, the value of the imaginary lines as mentioned above becomes of utmost importance, e.g.,—in one of the most frequent injuries of the atlas, forward dislocation of the head and atlas upon the axis, the following points are to be noted: First, that the line AB (Figure 5) will be no longer parallel to the line CD, and if extended would very soon meet. The vertical line produced by the retro-pharyngeal structures anterior to the anterior tubercle of the atlas will be distorted. The lines EF and GH will remain parallel, and the normal distance apart, but occasionally more of the lateral masses may be demonstrated on the plate. This observation must be kept in mind so that it is not confused with the production of new bony tissue in this region. The length of the posterior arch and tubercle behind the line CD is very much shortened. The anterior margin of the posterior tubercle will also be seen on a plane anterior to the anterior margin of the spinous process of the axis. Occasionally a fracture of the odontoid process can be recognized in the lateral position, but it is usually seen better in the antero-posterior view.

In Figure 7 will be noted that the vertical lines AB and CD do not continue along the anterior and posterior surfaces of the cervical bodies, being suddenly interrupted at the third cervical vertebra. The line formed by the retro-pharyngeal structures is also interrupted in the same area. Nothing can produce this change, except a forward dislocation of the skull, atlas, and axis of the third cervical vertebra. It will also be noticed that the anterior part of the posterior tubercle is on a more anterior plane than the anterior part of the spinous process of the axis, which is not normal. However, the relation of the remaining parts of the atlas and axis to each other is normal. Naturally one will wonder what condition can produce such a change. A careful examination of the laminae of the axis will reveal a break in continuity,—a positive diagnosis of a fracture. This readily accounts for the distorted relation of the posterior tubercle to the spinous process of this vertebra.

In Figures 8 and 8-A will be noted that the vertical lines AB and CD do not continue along the cervical bodies, being interrupted, as is also the line produced by the retro-pharyngeal structures. A diagnosis of anterior dislocation of the skull and atlas on the axis can readily be made. However, the outline normally formed by the body of the axis is distorted, and shows considerable less density than normal, which is diagnostic of a pathologic change in this body, which in this case is metastatic carcinoma. In the original plates it can be seen that the odontoid process has separated from the body of the axis and is in contact with the anterior arch of the atlas.

2. *Antero-Posterior View.* In Figure 9 it will be noted that the imaginary lines LM, NO, PQ, and RS, extending from the lateral and medial margins of the lateral masses, do not pass through the lateral and medial margins of the superior articular processes of the axis. The two lateral lines do not touch the axis at all, while the median lines pass through the center of the superior articular processes. The space between the two median lines is also much larger than normal. There is no position in which the normal head can be placed to secure this result. The only thing possible that will do this is a fracture of the anterior and possibly posterior arch of the atlas, thereby separating the lateral masses.

Dislocation, without fracture of the atlas, will

always obliterate the normal articular space between the inferior articular surface of the lateral mass of the atlas and the superior articular process on the side of the dislocation, or both sides. (See Figure 11.) There is no possible position in which the normal head can be placed to obliterate the normal articular space mentioned above.

#### *Congenital Malformations of Upper Cervical Region.*

The most important congenital malformation in the upper cervical vertebrae from the roentgen viewpoint is that of the posterior arch of the atlas. Comparatively frequently a bony spiculum is seen which arches backward from the posterior extremity of the superior articular process of the atlas to the posterior arch, converting the vertebral groove into a foramen, through which the vertebral artery passes. (See Figures 12, 13, 14.) This foramen should not be confused with an area due to destructive bone pathology.

#### ROENTGEN TECHNIC OF UPPER CERVICAL REGION.

1. *Lateral View.* The patient is placed in the prone position with the head resting on the table, the face being directed upward, parallel to the table. In this position a line perpendicular to the table can be drawn from the lower border of the upper incisor teeth to the tip of the mastoid process. If a lateral view of the entire cervical region is desired, the shoulders are forced downward as far as possible and a plate is placed on the lateral side of the neck, pressing down on the shoulder. The plate is held in (Figures A and B) position by a headrest, sand bags, etc. The tube is tilted on its side, a small diaphragm, together with a small cone, being used. The central ray is centred immediately posterior to the ramus of the mandible.

Another position which will give the same results is obtained by having the patient sit in a chair with the tube tilted on its side. The plate is held by an assistant against the neck.

2. *Antero-Posterior View.* In the ordinary antero-posterior view of the cervical region the upper two or three cervical vertebrae will not be seen, on account of the location of the mandible anterior to these vertebrae. In order to obtain an antero-posterior view of the atlas and axis it is necessary to place the patient on the table in a manner similar to that necessary for

a lateral view, *viz.*, prone position with head on table, face directed upward, parallel to table. The mouth is opened to its greatest extent, a cork being placed between the teeth to maintain this position, and a plate is placed well up under the occiput. A small diaphragm, together with a small cone, is used, the central ray being centered over the center of the open mouth.

#### DISCUSSION.

DR. S. W. ELLSWORTH, Boston: I feel that we are under obligation to Dr. George for describing a very simple and useful method of studying such a difficult part of the skeleton as the cervical spine. In the plates ordinarily taken of this part, the bony outlines are very indistinct; with the aid of the parallel lines, however, one should be enabled to study abnormalities of position or outline with greater accuracy.

Anomalies of the atlas occur more commonly than is generally supposed; they will be frequently found if searched for and should not be confused with traumatic deformities.

I have here as an example of the anomaly of the posterior foramina, the atlas from a skeleton which we have used in the study of x-ray plates, which shows the arches behind the articular facets.

This paper illustrates again the fact that we must review our anatomy repeatedly; careful study with the aid of the x-ray plates will show many new and novel conditions.

DR. G. W. HOLMES, Boston: I think we ought to thank Dr. George for giving us some help on a most difficult part of the anatomy to study with the x-rays.

It is of greatest importance to have an established normal in mind before attempting to interest the pathological. There are a great many things which may cause the normal to look abnormal. Even if particular care is taken in placing the patient, it is perfectly possible to have very abnormal pictures. It is a great help to have a definite standard in mind.

In regard to the question of using this method for teaching, I would say it would depend largely upon the class of students being taught. If you are teaching radiologists it would certainly be a good guide. But in teaching undergraduate students of medicine I should bring out a little more the clinical side. These students do not have a sufficient knowledge of x-ray interpretation to rely wholly upon the x-ray findings. It is much better, as a rule, for the student to keep in mind his clinical evidence, and I should try to impress upon him that if he has a picture which to him seems to be abnormal, his diagnosis ought to hinge more on the clinical findings than on the x-ray.

## CERTAIN DIAGNOSTIC ASPECTS OF MEDICO-SURGICAL DISEASES OF THE GASTROINTESTINAL TRACT.

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As an introductory remark I wish to explain that I am neither a surgeon nor a radiographer, but I think no one can hope to accomplish much in diseases of the gastrointestinal tract who is not at least somewhat skilled in the fluoroscopy of that region.

There is, perhaps, no field in medicine more burdened with unproven theories than that of the diseases of the gastrointestinal tract. There are obvious reasons for this. In the first place the extent to which patients can be investigated is often necessarily so limited that but comparatively little can be accomplished in many phases of the field in question. Animal experimentation is very difficultly applicable to many phases of pathological gastrointestinal conditions in man due to many differences between man and animal, including differences in the nervous constitution of the lower animals as contrasted to that of man. Because of these difficulties there is frequently a lack of knowledge (1) of the etiological factors of gastrointestinal diseases, and (2) of the pathological physiology of these diseases.

As a result, there exists a great diversity of opinion regarding the question of the predisposing factors, the etiology, the basis for diagnosis and the proper treatment of most abnormal gastrointestinal conditions. A method which will assist in settling any of these questions is obviously of great value to the physician, especially to the internist. In the radiographic fluoroscope such a method is available. Fluoroscopy is ordinarily much more valuable than radiograms because of the length of time in which the movements of the stomach and intestines can be observed, the different views obtainable by changes in the position of the patient and the various manipulations that can be carried out. Radiographic photographs represent but fractions of seconds of time at the most and phenomena of importance are often missed as a result. Fluoroscopy presents a great field of still untouched problems. Nevertheless, much that is valuable is known about the interpretation of the appearance of the alimen-

tary tract after feeding a meal of an opaque salt, such as barium sulphate. It is my impression that the value of the fluoroscope and of a certain number of fairly common fluoroscopic findings are not generally known, or if they are known their importance does not seem to be appreciated. It seems desirable, therefore, to discuss some of these findings. In order that they may be more fully understood a short discussion of the phenomena normally occurring in the passage of a barium meal through the alimentary tract will be given.

The bolus of the meal stops momentarily at different regions during its passage through the esophagus. The longest delay occurs at the cardiac orifice of the stomach. The stomach itself is examined (1) for a residue of a barium meal given six hours previous to the examination, (2) for the different types of peristalsis, especially hyperperistalsis, (3) for focal areas of abnormal muscular contractions in the walls of the stomach, (4) for spasms and deformities of the stomach walls, and (5) for abnormalities in the size, shape, and the position of the stomach. The first portion of the duodenum leading off from the stomach, the so-called duodenal cap, is examined for deformities in its outline. The remainder of the small intestines and colon we shall not consider at present.

Two phenomena encompass the majority of abnormalities seen by means of the fluoroscope. These are (1) the functional muscular phenomena of overactivity on the one hand, and atony on the other hand, and (2) actual structural changes in the walls of different parts of the alimentary tract. These structural changes produce very distinct deformities and their significance is generally appreciated. But abnormal appearances due to muscular phenomena are often not so striking nor their meaning so universally recognized. Indeed, the diagnostic status of many muscular phenomena as seen through the fluoroscope is not definitely settled. The best known of the muscular phenomena are hyperperistalsis, the spasm producing an incisura, and atony. The clinical significance of spasms and of hyperperistalsis in the stomach are prone to be neglected by internist and surgeon alike. These conditions may not be diagnostic of any lesion in themselves but a certain number of them furnish confirmatory evidence that at times is of the utmost aid in diagnosis.

The following cases will illustrate this and,

also, the difference in appearance between muscular spasm and actual deformity:

CASE 1. E. A., white, male, aged 45. O.D.D. No. 52418. Diagnosis: Carcinoma of the esophagus. The past medical history was essentially negative. He had lost ten pounds in weight during the last few months. The present illness began six years before admission. It consisted of epigastric distress after meals. Occasionally severe epigastric pain would also occur. Beginning three months ago the patient had noticed increasing difficulty in retaining food. On admission to the Out-Door Department but little food could be taken without immediate regurgitation. Physical examination, except for evidences of some loss of weight, was essentially negative.

Röntgen report. No. 13785. The esophagus was slightly dilated. The swallowed barium stopped in the region of the cardia. This portion of the esophagus was irregular in outline. A little barium trickled through into the stomach. Visible peristalsis was seen in the esophagus and at times it was reversed in type.

Laboratory findings were negative. The Wassermann reaction in the blood serum was negative.

CASE 2. C. E. H., white, female, aged 55. S. No. 10159. Diagnosis: Cardiospasm. The past medical history was essentially negative. The present illness dated from an attack of pneumonia at the age of 28 years. From that time up to the age of 50 years there was occasional regurgitation of swallowed food. During the past five years, after eating a considerable quantity of food, it would frequently all be regurgitated and spit out of the mouth. Except for evidence of a poorly nourished condition, the physical examination was essentially negative.

Röntgen report. No. 14421. Six hours after the barium meal there was seen a large, somewhat fusiform, sharply defined shadow overlying that of the heart. Its lower extremity was conical in shape. A small quantity of the barium meal had reached the stomach. At the cardiac orifice of the stomach there was an almost complete obstruction, only a fine stream of barium was seen to run through it into the gastric cavity. The findings were those of marked dilatation of the lower end of the esophagus, due to cardiospasm.

Laboratory examinations were negative. The Wassermann in the blood serum was negative.

CASE 3. E. V. W., white, female, aged 21. Med. No. 10783. Diagnosis: Ulcer of the stomach (non-perforating); mitral stenosis. For the past five years the patient had had gastric attacks every few weeks consisting of nausea, headache, and vomiting. Acute gastric symptoms began one year ago with severe epigastric pain occurring about one hour after meals, while slight pain was present most of the time. Finally hematemesis occurred and the patient was given medical ulcer treatment with an apparent cure. Two months before admission to the Peter Bent Brigham Hospital the epigastric pain recurred. The physical examination was negative except for the signs usual for mitral stenosis.

Röntgen report. No. 14451. The stomach was normal in position and tone. It was freely movable. There was hyperperistalsis and a small six-hour residue. In the antrum near the sphincter was a small area in which peristaltic waves did not occur. This same condition persisted on two examinations made at twenty-four-hour intervals. The duodenal cap came off at one side of the sphincter. The cap itself was normal in position and in outline. The ileum was not remarkable. At the end of six hours the head of the barium column had reached the transverse colon and in 24 hours it was in the rectum. The cecum was normal. The appendix was not seen. The findings indicate the probability of a small ulcer in the antrum and involving the sphincter.

The laboratory findings in the urine, blood, and stools were negative. The fasting gastric contents contained no free HCl and showed a total acidity of 16. One hour after a test breakfast, the contents showed free HCl 22 and total acidity 50. The benzidine occult blood test was positive.

At operation a small ulcer in the antrum was found.

CASE 4. P. J. B., white, male, aged 40. Med. No. 10993. Diagnosis: (?) Gastric ulcer. A year and a half ago, following a fall, the patient had symptoms similar to the present attack. The present illness began seven weeks prior to admission to the Peter Bent Brigham Hospital and again followed mild trauma. The symptoms consisted of burning epigastric pain coming on about a half hour after meals.

Occasionally nausea was present, but no vomiting. The physical examination was essentially negative except for some tenderness in mid-epigastrium.

Röntgen report. No. 14697. The stomach was normal in position, tone, outline, and freely movable. The peristalsis was irregular and sluggish; at times three waves were visible. There was a small six-hour residue. On the lesser curvature, proximal to this antrum, there was an area in which no peristalsis occurred, although peristaltic waves were seen to pass over the greater curvature opposite this area. The same phenomena were noted on a second examination one week later. There was no irregularity in outline of the stomach. A good sphincter and first portion of the duodenum were seen. At the six-hour observation the ileum contained the entire barium meal. The cecum was not seen.

The laboratory findings in the blood, urine, and stools were negative. The fasting gastric contents were 34 c.c. in amount and showed no free HCl. The contents removed after a test breakfast contained free HCl 30 and total acidity 45. There was no occult blood. The Wassermann reaction in the blood serum was negative.

There are several features of importance in diagnosis which are illustrated in the cases which have just been presented. The two cases of involvement of the cardiac orifice of the stomach represented well the different picture produced by muscular spasm and actual structural deformity. In the case of cardiospasm (Case 2), the greatly dilated esophagus was smooth in outline. In the case of carcinoma (Case 1), the esophagus was but little dilated and its lower end very irregular in outline. In the diagnosis of lesions in the cardiac end of the stomach the fluoroscope is of indispensable value. Often lesions in this region are not visible in the radiographic plates after the stomach is filled with the barium meal; or the gas bubble in the fundus may prevent that region from filling with the barium salt and hence no irregularities are manifested. One of the most important parts of the radiographic examination is the observation of the barium meal as it enters the stomach. Lesions high up on the lesser curvature frequently cause marked swirls in the barium stream as it falls through the cardiac orifice, which are diagnostic evi-

dences of a new growth in that region. Structural deformities, due to perforating ulcers, may be seen at this time, while after the stomach has filled they may not be visible. Neoplasms involving the top of the fundus of the stomach may best be demonstrated by the fluoroscope after filling that region with the barium meal. The demonstration is made possible by the fact that the inspiratory contraction of the diaphragm presses on the fundus of the normal stomach and causes it to assume a very different shape from that found during expiration. A new growth in the fundus may stiffen its walls and prevent these changes in shape from occurring.

The factors in the fluoroscopic picture which are significant of ulcer are hyperperistalsis, an incisura, a residue six hours after the barium meal, and a deformity of the stomach walls. In the case of gastric ulcer (Case 3) and the case of questionable gastric ulcer (Case 4), which have just been presented, there were no true deformities of the stomach walls, but there were focal areas in which peristalsis did not occur and which is considered to be the result of muscular spasm in these areas. The radiographic findings were not necessarily diagnostic of gastric ulcer, since both the hyperperistalsis and the muscular spasm may result reflexly from conditions outside the stomach. But the radiographic findings, especially the focal area of muscular spasm in one of these cases (Case 3), when combined with the history, particularly that of the previous hæmatemesis, made a very good picture of gastric ulcer. Furthermore, had it not been for the fluoroscopic findings this case would not have been recommended for operation. In the other case (Case 4), the onset following mild trauma pointed to a neurosis as the cause of the symptoms. But the radiographic findings in this case were strongly indicative of ulcer. In such cases it seems wise to institute medical treatment for ulcer and to allow the progress of the case to govern further therapeutic measures. The radiographic findings in these two cases were such that it is questionable whether the radiographer should attempt a diagnosis. In any event it is not his province to do so. There are relatively few x-ray findings which are diagnostic in themselves, but there are many concerning which the radiographer can make valuable suggestions. It is usually unfair to ask

the radiographer for more than a description of his x-ray findings and for suggestions as to their meanings. To ask him to make a diagnosis means that he is expected to be highly skilled in medicine, surgery, and many of the specialties. The findings in these cases show the importance of the physician learning to interpret the roentgenologic findings in relation to the clinical symptoms in a given case, in order to be able to glean the most benefit from x-ray studies.

Spasms of the musculature of the gastrointestinal tract, as has already been stated, may be due to extraneous causes. These may be functional or organic. Extrinsic spasm is commonly differentiated from intrinsic spasm by the fact that the former is usually not present upon a second examination and that it almost invariably disappears after the administration of atropine. The following case may be used as an illustration:

CASE 5. E. C., white, female, aged 41. O.D.D. No. 55822. Diagnosis: (?) Cholelithiasis. The patient had had attacks of bronchial asthma for several years. Seven years before admission to the Out-Door Department she had had a uterine operation of unknown character. The present illness dated back nine years. It consisted of very severe epigastric pain, lasting from a few hours to a day, unless relieved by morphine. The pain occurred at irregular intervals. At times it would begin in the left hypochondrium and radiate to the epigastrium and to the back. Physical examination was essentially negative. Radiograms of the gall bladder and the kidneys showed no shadows of calculi.

Roentgen report. No. 14691. The stomach was low in position, normal in tone and outline. There was no residue remaining from the barium meal given six hours previous to the examination. On feeding the second barium meal hyperperistalsis was present. A constant incisura was seen in the pars media of the stomach and persisted throughout the examination. Twenty-four hours later another barium meal was given, but the incisura was not again found. The ileum contained a six-hour residue, at which time the head of the barium column had reached the transverse colon. In twenty-four hours it was in the rectum. The cecum was normal.

The laboratory findings were negative.

One factor of interest concerning the radiographic findings in the examination of the duodenum is the presence of deformities which are artifacts. From time to time one sees in the report of some radiographer's findings the description of a deformity in the first portion of the duodenum. Upon making another fluoroscopic examination of the same patient, one may be surprised not to find the deformity described. It should be emphasized that the deformity may have been an artifact such as may be caused by the pressure of some extraneous body, often the spine, or the duodenum, or it may be due to transitory spasms. Such artifacts must be ruled out before making the diagnosis of a persistent deformity in the duodenum from the fluoroscopic picture. When a duodenal deformity is reported in a case in which that finding cannot be accounted for clinically, the radiographic studies should always be repeated. On a second examination, the deformity may not again be found. If such a deformity persists, radiographers are prone to make the diagnosis of superficial ulceration. Whether or not this diagnosis is correct, in the absence of clinical symptoms of ulcer, it may be questioned. One certainly hesitates to advise operation without more evidence, and as a result the significance of the fluoroscopic findings remains unsettled in this type of case. However, it appears rational to advise medical treatment.

Antiperistalsis, or reversed peristalsis, invariably points to some lesion in the gastrointestinal tract, which is usually, but not always, obstructive in type. It may accompany gastric lesions remote from the pylorus. For instance, Dr. McCarty and I have observed antiperistalsis occurring above a perforated gastric ulcer situated on the lesser curvature some distance from the pylorus. Antiperistalsis can, of course, be demonstrated only by the fluoroscope. Its value as a diagnostic measure is illustrated in the following case:

CASE 6. E. C. W., white, female, aged 18. Med. No. 10721. Diagnosis: Visceroptosis; hyperchlorhydria; partial obstruction at duodeno-jejunal junction. During the past three years the patient had had, three or four times a year, attacks similar to the present one, but not so severe in character. Ten days before admission to the hospital she had severe pain in the umbilical region, persisting about one

hour. A similar attack of pain recurred the next day, and at the time the patient vomited once. Three times since then similar attacks of pain occurred, but there was no vomiting, although nausea was present. The physical examination was essentially negative.

Roentgen report. No. 14452. The stomach was low in position and to the left the greater curvature being below the level of the symphysis pubis. It was freely movable, atonic, and peristalsis was sluggish. There was a small residue in both the stomach and duodenum of the barium meal given six hours previously. The sphincter and first portion of duodenum appeared normal. The second and third portions of the duodenum were dilated and showed reversed peristalsis. At the end of six hours after the barium meal the head of the barium column was still in the ileum. At the end of twenty-four hours it had reached the rectum. The cecum was normal in outline; it was situated in the pelvis and it contained a twenty-four-hour residue. The appendix was not seen. The findings were those of ptosis and partial obstruction at the duodenojejunal junction.

Examination of the urine showed a slight glycosuria. The fasting stomach contents showed free HCl to be 76 and total acidity 98; after a test breakfast free HCl was 64 and total acidity 146. No occult blood was present. The Wassermann reaction in the blood serum was negative.

In this case the diagnosis of obstruction rested very largely upon the presence of antiperistalsis. We have seen the duodenum larger even than in this case without other evidences of obstruction either from the radiographic or clinical standpoint.

Before leaving the subject of roentgenology one feature, apparently often neglected, will be mentioned. Operations on the stomach and intestines should always be followed by a detailed fluoroscopic report and radiograms of the operated region a month or two after convalescence has been established. If a question of a new lesion arises, perhaps several years afterwards, the abnormal conditions resulting from the operation may make the interpretation of further radiographic studies difficult, or even impossible. This is well illustrated by a case recently referred for x-ray studies. Two years previously the patient had had a gastroenterostomy performed for a duodenal ulcer, with

apparent recovery. At the time she was referred for radiographic studies she had been suffering for a month with epigastric pain, occurring three or four hours after meals. There had been rather frequent vomiting. On fluoroscopic examination the barium meal was seen to leave the stomach through the pyloric sphincter and through the stoma of the gastroenterostomy. There was a deformity in the first portion of the duodenum. No post-operative radiographic studies had been made soon after the laparotomy two years previously. Therefore, whether or not the deformity was of recent development could not be determined.

Another phase of the gastrointestinal field which has received more attention than even roentgenology is that of diet and medication. Diet and medication may be made of direct and practical value in the diagnosis of gastrointestinal disorders. The factors which led up to the work on which this statement is based are of interest. In the first place, a collection of the dietary measures and of the theories concerning their application of different well-known gastroenterologists demonstrated the existence of a great diversity of kinds of foods to be used in, and of opinions concerning the treatment of, each and every type of gastric and intestinal disorder. For example, diets for ulcer vary from the high calorie meat-containing regime of Lenhartz through the milk and alkali treatment of Sippy to the starvation method of von Leube. Just as radical differences exist in the treatment advised for other conditions such as hyperacidity, hypersecretion, chronic dyspepsia, etc. These findings might well lead one to question the importance of dietary measures in many of the gastrointestinal conditions. So the first of this year a study of the reaction of patients with certain of the gastrointestinal disorders to a wholesome general diet was begun. From the results so far obtained it may be stated that in every case in which it was proved that a patient could not eat with comfort a diet rational for a healthy person leading about the same mode of life, some apparently definite underlying cause was found. The most common of these causes have proved to be (1) functional nervous conditions, (2) organic disease either of the alimentary tract, or other organs, or constitutional in type, and (3) the introduction into the system of toxic substances such as lead,

mercury, etc. Hyperacidity, anaecidity, hypersecretion, chronic dyspepsia, etc., so far have been able to be interpreted as symptoms of some underlying cause. Until the basic cause has been definitely established the use of drugs and diets has certain evils. They may alleviate, even in organic disease, the gastrointestinal symptoms. The assumption is then prone to be made that the case is purely functional in nature and further investigation into its cause is neglected. As a result, some organic diseased condition may be overlooked. The following case strikingly illustrates this point:

CASE 7. M. J. S., white, male, aged 50. O.D.D. No. 46279. Diagnosis: Carcinoma of the stomach. The past medical history was essentially negative. He had lost six pounds in the four months before admission to the Out-Door Department. One year prior to his admission to the Out-Door Department he had had hematemesis. Following this he received medical treatment for gastric ulcer and apparently made a good recovery. About every two months since then he had had slight dyspeptic symptoms lasting for periods of a week. The symptoms consisted of some epigastric distress and belching, appearing after food and lasting for an hour. The last attack began ten days before admission to this clinic. The usual symptoms were present except that the epigastric distress was worse. He complained that he seemed to be losing strength. On physical examination the patient appeared very sallow. Otherwise the examination was essentially negative.

Roentgen report, No. 11607. The stomach was atonic, normal in position, and freely movable. Peristalsis was sluggish. There was a trace of the barium meal given six hours previous to the examination. As the barium entered the stomach through the cardiac orifice it was seen to take an irregular course. There was a constant, mottled irregularity in the outline of the cardia and lesser curvature in that vicinity. The sphincter and the duodenum were normal. The ileum contained a residue six hours after feeding barium. At this time the barium column had reached the cecum. In twenty-four hours it was in the rectum.

Examination of the urine was negative. The blood showed 75% hemoglobin and 5,500,000 red cells per cubic millimeter. No free HCl was present in the gastric contents removed

after a test breakfast. The total acidity was 10. There was no lactic acid or Oppler-Boas bacilli. The Wassermann reaction in the blood serum was negative.

The patient whose case has just been described was a chef. He ate at frequent and irregular intervals. His meal hours were regulated and he was given a diet of milk, eggs, toast, cereals, and scraped beef. Within a few days he became free from all symptoms. After two weeks he had gained a pound in weight. At this time radiographic studies were made. The complete abatement of all symptoms had led to the opinion that they had been due to the patient's habits of eating. Subsequent studies have demonstrated that he can remain symptom free only on a limited diet. Errors in diagnosis similar to the one occurring in this case may arise in ulcer cases, especially after an operation for gastric or duodenal ulcer. Not infrequently special dieting with or without antacids relieves the symptoms, their ultimate cause is not considered an important matter, and the physician is led to overlook what may be the first signs of the return of the former trouble. For this reason if such a patient cannot eat a wholesome general diet the reason should be ascertained. This discussion is not to be construed as meaning that certain drugs and methods of special dieting are never of value. But it is for the purpose of emphasizing the fact (1) that symptoms valuable for diagnostic purposes may be masked by the too early use of these therapeutic measures, and (2) that an attempt should always be made definitely to establish the underlying cause for gastric symptoms.

#### SUMMARY.

By means of illustrative cases an attempt has been made to emphasize (1) the value of the fluoroscope in the diagnosis of some of the gastrointestinal disorders, (2) the clinical significance of certain abnormal muscular phenomena of the alimentary tract, (3) the necessity for the clinician to learn the radiography of his chosen field, and (4) the possibility of masking important symptoms by the too early use of special dietary measures.

#### DISCUSSION.

DR. JOSEPH H. PRATT, Boston: In his consideration of diagnostic methods to be applied in gastrointestinal diseases, Dr. McClure has



done well to emphasize the importance of the fluoroscopic examination and of dietary measures. The radiological examination is too often limited to the study of plates, and the importance of diet in diagnosis is not generally recognized. I wish that the reader had also called attention to the importance of a complete history in the differentiation of the neuroses from organic diseases of the stomach and intestines. My personal observations incline me strongly to the view that the majority of patients who complain of indigestion are suffering from the gastric or intestinal manifestations of neurasthenia or hysteria.

There is a tendency on the part of many physicians to deny the existence of neurasthenia and to regard this diagnosis as nothing more than a confession of an inability to ascertain the true nature of the trouble. To all who hold that neurasthenic symptoms are to be regarded as an expression of intestinal auto-intoxication, chronic appendicitis, eye-strain, displacement of the viscera, or other somatic diseases, the masterly work of Dejerine on the psychoneuroses can be recommended. Neurasthenia, as Osler says, is a disease above all others which has to be diagnosed from the subjective statements of the patient, rather than from the physical examination.

As an aid in diagnosis of the gastric and intestinal forms a full history of the emotional shocks and strains is of the greatest value. A good anamnesis may take much time but it may make the diagnosis clear and save the patient from a long course of medical treatment or a surgical operation.

The diagnosis is often difficult. Many cases of neurasthenia with stomach and intestinal symptoms as their chief or only definite manifestations are mistaken for a variety of organic diseases, and it must be admitted, on the other hand, that various lesions of the abdominal organ are sometimes wrongly diagnosed as neurotic in origin.

The study of neurasthenia has been left chiefly to neurologists, but the great majority of the patients with gastric and intestinal symptoms naturally go to gastro-intestinal specialists rather than to neurologists. Dercum of Philadelphia states in a recent paper that he rarely has a patient, with hysteria admitted to his wards whose abdomen does not bear the scar of one or more operations. I am sure that our Boston surgeons, as a whole, realize the care that should be taken in ruling out neuroses before operating, and many recognize the great frequency of neurasthenia and hysteria among the patients who seek relief by operation for abdominal symptoms.

The chief factor in the etiology of a severe gastrointestinal neurosis may be, as Dejerine says, injudicious remarks of a physician or a faulty diagnosis of organic diseases. Recently I saw a striking illustration of this. A man of

48 who had never been troubled with indigestion had a severe cold with trivial discomfort in the epigastrium for a few days' duration. He was nervously tired at the time as a result of his mother's long and distressing illness. The attending physician on his second visit told him that he had a gastric ulcer and that an operation was necessary. The patient was greatly disturbed by this diagnosis as a neighbor with gastric ulcer had suffered much and had undergone two operations with little relief. From that time, for a period of over two years, the patient had almost constantly a dull pain in the upper abdomen, so disturbing as to interfere with his sleep. He had several radiographic examinations and consulted a number of physicians, but no evidence of ulcer was found. Suspecting the pain was due to gall stones, I advised an operation which showed that the stomach, gall bladder and intestines were normal. After the operation the pain ceased. The lesson taught by this case was firmly impressed upon me, as I had mistaken a neurosis for an organic disease. Furthermore, I did not obtain the history of the emotional shock until after the operation. The patient had denied that he worried or that he was troubled by fears or had had any cause for mental agitation. His wife, however, told me that from the day the doctor told him he had a gastric ulcer his attention was focussed on his stomach. His preoccupation was only too evident to his family. The idea was so firmly fixed, that reassurance from a number of physicians he consulted was without avail. If I, or any one of his earlier physicians, had obtained a full history of his case a diagnosis could have been made with a reasonable degree of certainty, and by explaining to him the cause and nature of his trouble, he could probably have been cured without an exploratory operation.

DR. W. C. QUINBY, Brookline: I am sure that all surgeons should appreciate very highly the splendid signs of the times which Dr. McClure's work and paper illustrate; for we see here an internist holding a very broad viewpoint in regard to diseases of this special part of the anatomy and taking it on such a sound basis as that of anatomy and anatomical physiology, using an accurate method such as the fluoroscope to see the pathology of the living. Such methods of thorough study of our cases pointed out by Dr. McClure are those which are going to give the largest number of correct diagnoses, and he followed by the largest number of instances of proper curative treatment.

Furthermore, I think the point which he has brought out, in closing, in regard to clouding some of the symptoms in such cases as these, by instituting medical treatment and dietary treatment before having made a proper diagnosis, is an exceedingly important point.

There is no doubt whatever that the continua-

tion of work such as this will mean definite advance in the treatment of lesions of the stomach and intestines.

DR. J. B. BLAKE, Boston: I regret to say that I did not hear all of Dr. McClure's paper, but I did hear him say one thing of great importance—that if a man cannot take the diet that he ought to be able to digest at his age and in his particular line of occupation, there is something wrong with him. I think that is an extremely important general lesson for everybody to remember. It is the sort of simple conclusion which should come out of research, and investigation and study of the newer and more complicated methods of diagnosis. Assuming it to be a fact, it is somewhat parallel to the observations of McKenzie on the heart, *viz.*, that all the laboratory methods of testing the power of the heart are no better than the clinical findings, if the clinical findings are carefully carried out. I feel certain that Dr. McClure is entirely right. A man who is healthy ought to be able to eat and digest properly an average diet. If he cannot do that he has either got a definite organic disease or one of the other conditions which Dr. McClure mentioned.

### Book Reviews.

*Neoplastic Diseases.* By JAMES EWING, A.M., M.D., Sc.D. Philadelphia and London: W. B. Saunders Company. 1919.

The author of this volume, "Neoplastic Diseases," by presenting tumors as specific diseases, represents a departure from the prevailing method of dealing with tumors. Until recently, tumors have been treated in a general way without any particular regard for the organ affected or the causative agent involved. The author of this book, however, believes that this attitude is detrimental to further enlightenment on the knowledge of tumors and endeavors in this volume to "analyze the numerous etiologic factors which meet in such diverse fashions in the inception of tumors, to emphasize the general dependence of clinical course upon histologic structure, to trace the histogenesis to the last degree, impressing its essential importance when known, and to enumerate and contrast the more striking clinical features which are often highly characteristic of different tumors."

The first part of the book deals with general oncology. A brief survey of historical theories shows the progress which has been made up to the present time and prophesies a period of specific etiological investigation in the future. The classification and general pathology of tumors, their malignance and its effect upon the organism are considered. Theories of the na-

ture of cancer, including the embryonal theory, the theory of cell autonomy, heredity, and the parasitic theory are discussed. In the field of experimental cancer research, the author considers various attempts which have been made to produce and transplant tumors experimentally. The second part of the book presents the origin, structure, and natural history of tumors, and considers fibromas, sarcomas, and cancers and other neoplastic diseases with reference to the organs involved. The text is illustrated throughout by several hundred photographs. By making more accessible the knowledge of tumors, this book is rendering a worthy contribution to the reduction of the mortality from cancer.

*The Blind.* By HARRY BEST. New York: The Macmillan Company, 1919.

The condition of the blind, narrated in many accounts of their struggles, fortitude, misfortunes, and attainments, has often been commented upon. Yet is it not too often viewed from a sentimental viewpoint rather than as a matter of scientific inquiry conducted for the purpose of solving the problems which these unfortunate individuals present? The author of *The Blind* has attempted to report the actual position of the blind in society and the work which is being done for them at the present time in the United States. He believes that provision for the blind has not been adequate in this country. It is true that schools have been established for the education of blind children; yet measures so that the adult blind may be equipped to meet the world in spite of their handicap have not yet been adopted. At the present time, partly due, perhaps, to the additional incentive of caring for men blinded by the war, interest in this problem is obviously growing. Aside from the preparation of reading matter and intellectual activity, small industrial establishments are now being organized and the matter of employment for the blind is receiving greater attention. In this volume, all these aspects of the problem,—the general condition of the blind, their education, their economic status, and the work of organizations interested in assisting the blind,—are presented in an unusually interesting way.

Yet, it is on no one of these aspects, but rather on the preventive activities, that the author of this book lays particular emphasis. The possibilities of the prevention of blindness are of primary concern to the individuals themselves, to physicians, and to the community. Examination of the causes of blindness, the effects of heredity, the extent to which certain diseases causing blindness may be arrested, and measures which may be adopted to prevent blindness due to accidents and injuries,—it is this phase of the problem which the author believes should be the main source of assistance and the chief concern of the people of America.

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## INSECT TRANSMISSION OR CAUSATION OF DISEASE.

IN an interesting article in *Science*, W. Dwight Pierce emphasizes the importance of locating the possible intermediate hosts and invertebrate carriers in studying the causation of disease. In order to stimulate research on this subject, he has outlined some of the steps which he considers necessary in successful investigation. He mentions as one of the primary requisites in a thorough investigation of disease transmission, coöperation between one or more physicians and diagnosticians, parasitologists, and entomologists, each phase being investigated by some member of the group. More satisfactory results and a greater amount of credence can be attained by the coöperation of a group than by the efforts of a single investigator.

There are two distinct methods of attempting to solve the problem of insect transmission. The

first is to work from the unknown disease and to learn by experimentation what species of insects might be concerned in its transmission. By the second method one might study all the insects involved in disease transmission and obtain by cultures and microscopic studies a knowledge of the parasitic organisms normally and occasionally found in these insects. It is probable that the first type of investigation would originate from public necessity and would be carried on by physicians and parasitologists, or by the suggestion of entomologists. The second line of investigations would originate as problems assigned by a professor or head of a laboratory to students.

The author has stated that insects may be involved in disease transmission either by transmission of an organism or the inoculation of a toxin; or there may be an intermediate phase in the life cycle of an organism, but not come directly in contact with the final host. Insects can carry bacteria, many types of protozoa, and many species of parasitic worms. Insect toxins may be introduced into the system by means of the mouth, claw, caudal appendage, or ovipositor of the insect. Some insects live as parasites on the bodies of men and animals: sometimes insect larvae are ingested as food, and continue to develop in the intestines or other organs, often at the expense of the tissues. Insects may obtain the organisms which cause disease directly from the blood of an infected host, from infected surfaces of the body, or from the excretions of an infected host. The organism may then be transmitted by the insect by direct inoculation through the proboscis or by the passive transmission of the parasite in the reflex actions which take place in the sucking of blood; the organism may be regurgitated by the insect on the body of its host and obtain entrance by its own activity, or it may pass through the insect and out in its feces, or in malpighian excretions. If the organism is taken up by the insect in its larval stage it may pass through a number of insects before finding a vertebrate host.

It is essential that workers be able to recognize the disease which they are studying. They should know its history and distribution, whether it occurs in pandemic, epidemic, endemic, or sporadic form, its relation to the physical, biological, or climatic features of the countries where it occurs, whether immunity or difference of susceptibility has been recognized,

its symptoms, theories of causation and dissemination, and suggested treatment.

Certain insects should be investigated with especial care, particularly insects which come in contact with the blood of the patient, or the food or feces. Before transmission experiments are begun, it is necessary to know the normal conditions of life of the insect, its food, methods of reproduction, and the proper conditions of the soil or water in which it is to be. The study of the causation of disease is receiving considerable attention today; it is to be hoped that the suggestions offered in this article may lead to greater effort in locating the possible intermediate hosts and invertebrate carriers.

### THE ROCKEFELLER FOUNDATION IN CHINA.

A SURVEY of the medical work being organized in the Far East is being made by Dr. George E. Vincent, president of the Rockefeller Foundation of New York. He has visited North China, particularly the new buildings of the Pekin Union Hospital, which are now being constructed. He has visited also the Union Medical College at Tsinanfu, and other mission hospitals in the north, for the purpose of bringing about a closer coöperation in equipment, training of the staff, and the supporting of these institutions. Dr. Vincent has discussed with representative missionary doctors from every province the aspects of medical work in China. Mission doctors will be invited by the Foundation to attend the Pekin institution for annual periods of study and research, a plan which will greatly encourage research on special diseases, to which it has hitherto been difficult for individual doctors to devote themselves.

The construction of the Pekin Medical College has been somewhat delayed because of difficulties in securing materials from the United States; but it is probable that the three main buildings will be opened for college work this fall and that the entire institution will be completed in September, 1920. It will be the most completely equipped institution for medical research and teaching in China. Clinical and research laboratories, the anatomical, chemical, and physiological departments, and laboratories for x-ray and for pathological and bacteriological investigations are unusually complete and are of the most modern type.

In addition to the development of medical science in Pekin, the Foundation, during 1918, assisted the work of nineteen hospitals and two medical schools in north, east, and central China. Special medical study in America was made possible for thirty-five medical missionaries and thirty Chinese physicians and nurses. Dr. Vincent has expressed his belief that medical progress in North China has given evidence of the correctness of the Foundation's policy of training the young Chinese student so that he may ultimately be able to become responsible for the health administration in his own country.

### PSYCHICAL RESEARCH IN DELINQUENCY.

THE various problems which are encountered in dealing with psychopathic delinquents, discussed by Dr. Katherine Bement Davis at a recent session of the American Institute of Criminal Law and Criminology, indicate the importance of more thorough psychical research in dealing with people of this sort. Dr. Davis has commented upon the attitude of our institutions, and has offered several valuable suggestions for overcoming difficulties which exist under the present system. In many institutions, women and girls who are given good care and proper discipline complain of being ill treated. Dr. Davis believes that there are three factors which lead to this situation: First, the lack of scientific training in dealing with cases of genuine mental disturbance among those in charge of our women's institutions; second, the lack of equipment and a properly trained staff for handling these cases; and third, perhaps the most important cause of disturbance, the fact that in these institutions are gathered together all kinds of women, the only thing which they have in common being the violation of the law.

Dr. Davis points out that feeble-minded persons who need permanent custodial care are often not desirable inmates of an institution whose purpose is to make it possible for delinquent women to return to society. It is difficult to take care of women of pronounced psychopathic tendencies in the midst of a group who must be treated as normal persons if the institution is to accomplish its reformatory purposes.

Attempts have been made for the last ten years to secure proper treatment for the feeble-minded in the State institutions and to have removed from ordinary reformatory institutions feeble-minded delinquents. Persons who can never become self-supporting members of society should not be harbored in penal institutions whose primary aim is education. Dr. Davis points out that the courts can help to overcome this difficulty by establishing clinics for examination into the mental condition of delinquents in connection with judicial procedure.

### MEDICAL NOTES.

**GOVERNMENT WANTS WORKERS IN VENEREAL DISEASE CAMPAIGN.**—The recently created Interdepartmental Social Hygiene Board of the United States Government is in need of a number of specially trained men and women to complete its organization. The United States Civil Service Commission has announced examinations for the following positions: Chief of division for scientific research, \$3,500 to \$4,500 a year; chief of division for educational research and development, \$3,500 to \$4,500 a year; educational assistant, \$2,800 to \$3,600 a year; chief of division of relations with states, \$3,500 to \$4,500 a year; chief of division of records, information and planning, \$3,500 to \$4,500 a year; supervising assistant and inspector, \$2,800 to \$3,600 a year; field agent, \$1,800 to \$3,000 a year. All positions are open to both men and women.

Applicants for these positions will not be given scholastic tests in an examination room but will be rated upon their education, experience, and writings. Published writings of which the applicant is the author will be submitted with the application. For most of the positions a thesis on one of a number of given subjects will be accepted in lieu of published writings. The receipt of applications will close on November 4. Detailed information and application blanks may be obtained from the United States Civil Service Commission, Washington, D. C., or from the Secretary of the United States Civil Service Board at the post office or customhouse in any of 3,000 cities.

The law creating the Interdepartmental Social Hygiene Board provides for a cooperation of the War and Navy Departments and the

Public Health Service of the Treasury Department for the prevention, control, and treatment of venereal diseases. The duties of the Board as set forth in the act are (1) to recommend rules and regulations for the expenditure of moneys allotted to states for the use of their respective boards or departments of health in the prevention, control, and treatment of venereal diseases; (2) to select universities, colleges, or other suitable institutions which shall receive allotments for scientific research for the purpose of discovering more effective medical measures for the prevention and treatment of venereal diseases; (3) to recommend such general measures as will promote correlation and efficiency in carrying out the purposes of the act; and (4) to direct the expenditure of certain moneys appropriated by the act.

**GERMAN PHYSICIANS IN RUSSIAN ARMY.**—A recent report has stated that the medical journals in Germany are publishing advertisements offering positions to German physicians and surgeons in the Russian Army. The right of securing homesteads is promised them. It has also been reported that medical men are being urged to enlist with the volunteer troops units organized for fighting bolshevism and are promised a premium of five thousand marks if the counter revolution is successful.

**INTERNATIONAL CONFERENCE OF WOMEN PHYSICIANS.**—An international conference and a national convention of women physicians will be held in New York City from the fifteenth of September to the twenty-fifth of October, 1919. Questions of physical, social, and moral health will be discussed by women physicians and psychologists from Scotland, England, Norway, Sweden, Denmark, France, Italy, Switzerland, Belgium, China, Japan, India, South America, Canada, and the United States. Addresses will be given on many subjects, including health and personality, exercise, clothing in relation to health, beauty, and practicability, national food economies, feminine handicaps, the value of work in the development of the child, industrial health, bacteria, health education, and emotional reactions to present social conditions and their effect on health. A series of meetings from October 17 to October 25 will be attended by invited non-medical men and women.

**RED CROSS NURSES IN THE WAR.**—The *Red Cross Bulletin* has stated that nineteen thou-

sand, eight hundred and twenty-seven Red Cross nurses have been in active duty with the Army and Navy Nurse Corps and the Red Cross, in this and foreign countries. One hundred of these nurses have died in the service.

AMERICAN PUBLIC HEALTH ASSOCIATION.—The American Public Health Association will hold its next annual meeting at New Orleans, La., October 27-30, inclusive. Southern health problems, including malaria, typhoid fever, and hookworm will be discussed, and a full session will be devoted to influenza for the purpose of developing methods of control. Other questions to be considered include the attitude of legislators toward public health, the obtaining of appropriations, coöperation from women's clubs and health organizations, and the organization of health centers. Public health administration, vital statistics, sanitary engineering, laboratory methods, industrial hygiene, sociology, food and drugs, child hygiene, and personal hygiene will be discussed at the various sessions. The program of the meetings will be published in the *American Journal of Public Health* issued on October 5.

DEPARTMENT OF HEALTH IN CANADA.—There has been passed recently in Canada a bill creating a federal department of health for the Dominion. It provides for the establishment of a department of health, for a minister of health, a deputy minister, and an advisory council.

MEDICAL DEPARTMENT OF THE UNIVERSITY AT MEMPHIS.—The following interesting account of a possible case of "shell shock" at the battle of Marathon, 490 B.C., described by Herodotus (Book VI, section 117) has appeared in a recent issue of *Science*:

The following prodigy occurred there: An Athenian, Epizelus, son of Cephagoras, while fighting in the medley, and behaving valiantly, was deprived of sight, though wounded in no part of his body, nor struck from a distance; and he continued to be blind from that time for the remainder of his life. I have heard that he used to give the following account of his loss. He thought that a very large heavily-armed man stood before him, whose beard shaded the whole of his shield; that this specter passed by him, and killed the man that stood by his side. Such is the account I have been informed Epizelus used to give.

Probably this is the first historical record of "shell shock."

APPOINTMENT OF DR. A. R. DOCHEZ.—Dr. Alphonse Raymond Dochez has been appointed associate professor of medicine at the Johns Hopkins University.

ANDREW CARNEGIE.—A recent issue of *The British Medical Journal* has commented upon the beneficent gifts of Andrew Carnegie and his influence on the progress of medicine in the United Kingdom. His gift of ten million dollars to the Scottish universities for the payment of fees, the encouragement of scientific research, and the furnishings of endowments for new lectureships and chairs and laboratories has benefited the departments of medicine. Through the Carnegie United Kingdom Trust, Mr. Carnegie has aided the prevention of disease among expectant mothers and young children. Mr. Carnegie's gift of \$100,000 to King Edward's Hospital Fund is still another example of his interest in the progress of medical science.

ROCKEFELLER HOSPITAL AND MEDICAL SCHOOLS IN PEKING.—Work on the construction of the new Rockefeller Hospital and Medical Schools in Peking is progressing satisfactorily. The corner stone was laid on September 24, 1917, by Mr. Fan Yuanlien, Chinese Minister of Education. The site covers an area of ten acres. It has been found possible to use Chinese materials almost exclusively by an adaptation of Chinese architecture, which harmonizes in design with the monuments in Peking. The courtyards, gateways, and walks have been treated in a Chinese way, and many fine trees and a Chinese rock garden add greatly to the beauty of the buildings.

DRUG ADDICTION.—In a recent number of the *American Journal of Public Health*, Ernest S. Bishop, M.D., has discussed the subject of drug addiction. He believes that this is a disease, and should be studied and treated from a scientific, rather than from a social and legal point of view. Drug addiction is recognized as a problem involving nearly as many persons as tuberculosis, people who should not be regarded purely as mental degenerates. Dr. Bishop thinks it probable that drug addiction exists in mentally, morally, and physically normal individuals as well as among the lower classes

with whom it is generally associated, and that it may best be explained by the presence of some substance developed and circulating in the blood. In order to deal more adequately with the drug situation, the author recommends organized scientific, medical, or public health activity directed towards the clinical and laboratory investigation of this disease.

**FRENCH AND AMERICAN PHYSICIANS.**—It has been announced in *Le Temps* that an organization has been formed for the purpose of establishing permanent relations between American and French physicians and surgeons. Commissions have been appointed to take charge of the establishment of a course of teaching for American physicians visiting France, to found a bureau of information, and to examine into means of organizing an exchange of articles on medical and surgical subjects between the journals of the United States and France.

**FUTURE RED CROSS ACTIVITIES.**—The American Red Cross has announced that the third roll call will be held from November 2 to 11, when the American people will be asked to renew their membership for 1920 and contribute \$15,000,000 for the future work of the organization.

Foremost among the activities during the coming year will be nation-wide activity for the promotion of public health; a vigorous campaign for the extension of the country's nursing resources; the broadening of Red Cross home service; increased junior Red Cross activities; extension of Red Cross facilities for emergency disaster relief; completion of relief measures for the sufferers from the war in this country and overseas, and preparation to fulfill whatever duties may be laid upon it as the official volunteer relief society authorized to assist the Army and Navy.

The announcement has emphasized the importance of public health nursing. Red Cross public health nurses will be assigned to as many small communities as possible. The following statement outlines the work which will be undertaken by the Red Cross in addition to public health activities:

"The Red Cross must hold itself ready for instant relief service in time of public disaster, such as great fires, floods, cyclones, shipwrecks, earthquakes, pestilence, famine, and epidemics.

"The turning over to the American Red Cross of the surplus medical and surgical sup-

plies and supplementary food stores of the American Army abroad for distribution among the still suffering native populations, together with the foreign relief programs still being carried out largely in Poland, the Balkans, and Siberia, necessitates the continuance of Red Cross operations overseas.

"Until demobilization is completed, and after, the Red Cross military relief organization will continue to function. Thirty thousand service men still in the military hospitals, many crippled for life, require Red Cross attention. Hospital, canteen, and motor service must continue.

"Completion of Red Cross work for the soldiers disabled in the fighting and general assistance to the fighting men in getting back to civil life is still far off, particularly in the many and varied phases of home service. Thousands of families of service men are still being helped to solve their own problems by this Red Cross activity, and money relief in this connection alone is in excess of \$500,000 a month."

**FRENCH DECORATION FOR DR. WILLIAM PALMER LUCAS.**—Dr. William Palmer Lucas, Professor of Children's Diseases at the University of California Hospital, chief of all the work of the University for children, has received the notification from Monsieur André Tardieu, French Minister in charge of his government's American affairs, that the French government has conferred upon Dr. Lucas the order of Chevalier de la Legion d'Honneur, with the gratifying comment that the French people with whom Dr. Lucas had worked for the children of France had asked that he be decorated. At the same time Dr. Lucas was notified that the Minister of the Interior had conferred upon him France's highest medical decoration, "La Médaille de Vermeil des Epidémies," for services rendered to children of France.

#### BOSTON AND MASSACHUSETTS.

**NEW HOSPITAL AT NEWBURYPORT.**—The Julia M. Moseley ward of the Anna Jaques Hospital was opened for the care of tubercular patients on August 21. This building is separate from the main institution and was erected at the cost of \$40,000. It will accommodate sixteen patients.

**FRANKLIN DISTRICT MEDICAL SOCIETY.**—A meeting of the Franklin District Medical Society was held at the Mansion House, Greenfield, Tuesday, September 9. Dr. Herbert B.

Perry of Northampton, ex-Lieutenant-Colonel in the American Expeditionary Forces, spoke on "Empyema."

**PROPOSED COMPENSATION LAW.**—At a recent session of the National Conference of Commissioners on State Laws, held in Boston, a proposed law to provide compensation for disability and death from disease contracted as a result of occupation was discussed. The effort to draft this act is in response to a growing demand for legislation arising from conditions prevalent in certain classes of employment where lead, mercury, phosphorus and arsenic or carbon bisulphide, nitrous fumes, African boxwood, chronic acid, bichromate of ammonium, potassium, sodium, tar, pitch, bitumen, mineral oil, paraffine, and compressed air are utilized in a commercial process.

The discussion indicated that there was a difference of opinion as to whether or not the law should include a schedule showing what diseases should be included within its scope, or whether it should contain a general provision under which the merits of each case should be left to the determination of the commission or the jury. The law as framed by the committee contained a schedule of 26 compensable diseases.

To be entitled to compensation for disability arising from such occupational diseases, it must have been due to the nature of the employment within the 12 months immediately preceding the date of disablement. Suitable physicians designated by the State Board of Health certify whether the disease is due to the nature of the employment. Provisions were made in the proposed law for future changes in the schedule of diseases.

It was finally voted, after considerable discussion, not to specify the occupational diseases for which workmen could receive compensation.

**GIFT TO MALDEN HOSPITAL.**—By the will of the late William B. Buckminster of Malden, one thousand dollars has been bequeathed to the Malden Hospital.

**WEEK'S DEATH RATE IN BOSTON.**—During the week ending August 30, 1919, the number of deaths reported was 143 against 192 last year, with a rate of 9.36 against 12.76 last year. There were 29 deaths under one year of age against 45 last year.

The number of cases of principal reportable diseases were: Diphtheria, 32; scarlet fever,

22; measles, 4; whooping cough, 17; typhoid fever, 5; tuberculosis, 43.

Included in the above were the following cases of non-residents: Diphtheria, 4; scarlet fever, 4; tuberculosis, 9.

Total deaths from these diseases were: Diphtheria, 2; scarlet fever, 2; typhoid fever, 2; tuberculosis, 16.

Included in the above were the following non-residents: Diphtheria, 1; scarlet fever, 1; typhoid fever, 1; tuberculosis, 1.

During the week ending September 6, the number of deaths reported was 183 against 179 last year, with a rate of 11.98 against 11.90 last year. There were 35 deaths under one year of age against 27 last year.

The number of cases of principal reportable diseases were: Diphtheria, 25; scarlet fever, 17; measles, 7; whooping cough, 4; typhoid fever, 4; tuberculosis, 31.

Included in the above were the following cases of non-residents: Diphtheria, 1; scarlet fever, 6; tuberculosis, 4.

Total deaths from these diseases were: Diphtheria, 3; whooping cough, 1; tuberculosis, 22.

Included in the above were the following non-residents: Tuberculosis, 1.

Influenza cases, 7.

**MIDDLESEX SOUTH DISTRICT MEDICAL SOCIETY.**—The following minimum fee table was adopted by vote of the Society, April 16, 1919: Ordinary visits, between 7 A.M. and 6 P.M., \$3.00; evening visits, between 6 P.M. and 9 P.M., \$4.00; night visits, between 9 P.M. and 7 A.M., \$5.00. Whenever more than one person is attended at a single visit, an extra charge, as for an office visit, shall be made for each person after the first. Office visits in *office hours*, \$2.00; advice by telephone, the same as office visits; vaccination, \$2.00; Necessary after-care shall be charged at regular fee. For a certificate of sickness, or health, or insurance, or a letter of advice, \$2.00; laboratory examinations, \$2.00; confinement, \$25.00; simple fracture or dislocation, \$15.00. An additional charge may be made for attendance upon cases of contagious disease or when extra time is spent, by travel, consultation or detention. Such deductions shall be made herefrom as charity may require.

**HAMPDEN DISTRICT MEDICAL SOCIETY.**—The annual clambake of the Society was held at Riverside Park, Agawam, Mass., on Tuesday, September 9, 1919, at 3.30 P.M. There were baseball games, tug of war, relay races and dashes.



## The Massachusetts Medical Society.

### OFFICERS OF THE MASSACHUSETTS MEDICAL SOCIETY.

Chosen by the Council, June 3, 1919.

Alfred Worcester, Waltham, President.  
Arthur R. Crandell, Taunton, Vice-President.  
Walter L. Burrage, Jamaica Plain, Secretary.  
Arthur K. Stone, Framingham Center, Treasurer.  
Edwin H. Brigham, Brookline, Librarian.

### STANDING COMMITTEES.

Of Arrangements.—R. H. Miller, C. H. Lawrence, Jr., Donald Macomber, A. W. Reggio, J. B. Swift, K. G. Percy.

On Publications and Scientific Papers.—E. W. Taylor, R. B. Osgood, F. T. Lord, R. M. Green, A. C. Getchell.

On membership and Finance.—C. M. Green, Algonon Coolidge, Jr., Samuel Crowell, Gilman Osgood, Homer Gage.

On Ethics and Discipline.—J. W. Bartol, Henry Jackson, T. J. Robinson, David Cheever, F. W. Anthony.

On Medical Education and Medical Diplomas.—Channing Frothingham, C. F. Painter, J. F. Burnham, A. G. Howard, R. L. DeNormandie.

On State and National Legislation.—Alfred Worcester, F. G. Wheatley, E. H. Stevens, J. S. Stone, A. R. Crandell.

On Public Health.—E. H. Bigelow, Annie L. Hamilton, E. F. Cody, Victor Safford, R. I. Lee.

### OFFICERS OF THE DISTRICT MEDICAL SOCIETIES, 1919-1920.

Elected by the District Medical Societies.

BARNSTABLE.—F. A. Binford, Hyannis, President; C. P. Curley, Provincetown, Vice-President; C. J. Bell, Wellfleet, Secretary; H. S. Hart, Yarmouthport, Treasurer; E. E. Hawes, Hyannis, Librarian.

BERKSHIRE.—E. H. Taylor, Pittsfield, President; W. P. Kelly, Pittsfield, Vice-President; O. L. Bartlett, Pittsfield, Secretary; J. D. Howe, Pittsfield, Treasurer.

BRISTOL NORTH.—H. G. Ripley, Taunton, President; Sumner Coolidge, Middleborough, Vice-President; A. R. Crandell, Taunton, Secretary; R. D. Dean, Taunton, Treasurer.

BRISTOL SOUTH.—J. A. Barré, Fall River, President; E. P. Gardner, New Bedford, Vice-President; A. J. Abbe, Fall River, Secretary and Treasurer.

ESSEX NORTH.—J. J. O'Sullivan, Lawrence, President; D. D. Murphy, Amesbury, Vice-President; J. Forrest Burnham, Lawrence, Secretary and Treasurer.

ESSEX SOUTH.—W. T. Hopkins, Lynn, President; R. E. Foss, Peabody, Vice-President; G. E. Tucker, Salem, Secretary; G. Z. Goodell, Salem, Treasurer; C. M. Cobb, Lynn, Librarian.

FRANKLIN.—Charles Moline, Sunderland, President; E. C. Thorn, Deerfield, Vice-President; F. A. Millett, Greenfield, Secretary and Treasurer.

HAMPDEN.—A. L. Damon, North Wilbraham, President; G. L. Gabler, Holyoke, Vice-President; H. L. Smith, Springfield, Secretary and Treasurer.

HAMPSHIRE.—H. J. Rockwell, Amherst, President; S. A. Clark, Northampton, Vice-President; J. D. Collins, Northampton, Secretary; J. G. Hanson, Northampton, Treasurer; F. E. Dow, Northampton, Librarian.

MIDDLESEX EAST.—R. D. Perley, Melrose, President; C. L. Soper, Wakefield, Vice-President; A. E. Small, Melrose, Secretary; Richard Dutton, Wakefield, Treasurer; G. W. Nickerson, Stoneham, Librarian.

MIDDLESEX NORTH.—J. H. Nichols, Tewksbury, President; E. J. Welch, Lowell, Vice-President; J. Y. Rodger, Lowell, Secretary; T. R. Smith, Lowell, Treasurer; P. J. Meehan, Lowell, Librarian.

MIDDLESEX SOUTH.—H. T. Baldwin, Chestnut Hill, President; E. H. Bigelow, Framingham, Vice-President; L. S. Hapgood, Cambridge, Secretary; Edward Mellus, Newton, Treasurer.

NORFOLK.—F. P. Denny, Brookline, President; G. W. Winchester, Mattapan, Vice-President; Bradford Kent, Dorchester, Secretary; G. W. Kaan, Brookline, Treasurer.

NORFOLK SOUTH.—E. H. Bushnell, Quincy, President; F. E. Jones, Quincy, Vice-President; C. A. Sullivan, South Braintree, Secretary, Treasurer, and Librarian.

PLYMOUTH.—Joseph Frame, Rockland, President; F. J. Hanley, Whitman, Vice-President; A. C. Smith, Brockton, Secretary and Treasurer.

SUFFOLK.—J. B. Blake, Boston, President; G. G. Sears, Boston, Vice-President; G. G. Smith, Boston, Secretary; D. L. Bristol, Boston, Treasurer; W. P. Cones, Boston, Librarian.

WORCESTER.—W. J. Delahanty, Worcester, President; F. H. Baker, Worcester, Vice-President; G. A. Dix, Worcester, Secretary; G. O. Ward, Worcester, Treasurer; A. C. Getchell, Worcester, Librarian *pro tem*.

WORCESTER NORTH.—W. F. Robie, Baldwinsville, President; C. E. Woods, Lanesburg, Vice-President; C. H. Jennings, Fitchburg, Secretary; F. H. Thompson, Jr., Fitchburg, Treasurer; L. F. Baker, Fitchburg, Librarian.

### MEETING OF THE COUNCIL.

A stated meeting of the Council will be held in John Ware Hall, Boston Medical Library, 8 The Fenway, Wednesday, October 1, 1919, at 12 o'clock, noon.

Business:

1. Report of Standing Committees.
2. Report of Delegates to House of Delegates, American Medical Association.
3. Reports of Committees appointed to consider petitions for reinstatement.
4. Petitions for reinstatement.
5. Appointment of Auditing Committee.
6. Appointment of Delegates to the meetings of the Conferences on Medical Education and Medical Legislation of the American Medical Association in Chicago, February, 1920.
7. Appointment of Delegates to the annual meeting of the Vermont State Medical Society at Burlington, October 9 and 10.
8. Incidental business.

WALTER L. BURRAGE, Secretary.  
Boston, September 24, 1919.

## NEWS FROM THE DISTRICT MEDICAL SOCIETIES.

The following note has been sent to the Councilors by the Editor for the Society:

Dear Doctor:

For the purpose of procuring more medical news from the eighteen District Medical Societies for the official organ of the Society, the *BOSTON MEDICAL AND SURGICAL JOURNAL*, will you be good enough to send me any items of news from your district, of which you have knowledge. I now live near at hand to the printing office where the *JOURNAL* is published weekly, and am in constant touch in the editing of the publications of the Society, so that matter sent me can be given to the printer promptly, and I am assured that it will be published as soon as space and makeup permit.

We want announcements that Fellows have returned from military or naval service and where they are to be found; notices of appointments to office, to hospital staffs, to medical examinations or to military or civil positions; as to the hospital or nursing situation in your community; also marriages and deaths. It has been the aim of the editor to publish in the *JOURNAL* a suitable notice of the death of every Fellow who passes on. Data from the friends of those who knew the departed will help to make the notices fuller and better. Announcements of the coming meetings of the District Societies should be sent in early, at least two weeks before a given meeting. Abstracts of the proceedings will be welcome.

Faithfully yours,

WALTER L. BURRAGE.

*Editor for the Society.*

42 Eliot Street, Jamaica Plain.

September 24, 1919.

Telephone, Jamaica 469.

## Miscellany.

### NOTICES.

THE ANNIVERSARY VOLUMES OF SIR WILLIAM OSLER. —The anniversary volumes published in honor of Sir William Osler's seventieth birthday will be ready for delivery by October first. Subscriptions are still being accepted and may be sent to the treasurer of the committee, Dr. Henry Barton Jacobs, 11 Mt. Vernon Place, Baltimore, Md.

ALVARENGA PRIZE OF THE COLLEGE OF PHYSICIANS OF PHILADELPHIA. The College of Physicians of Philadelphia announces that the next award of the Alvar-

enga Prize, being the income for one year of the bequest of the late Señor Alvarenga, and amounting to about two hundred and fifty dollars, will be made on July 14, 1920, provided that an essay deemed by the Committee of Award to be worthy of the prize shall have been offered.

Essays intended for competition may be upon any subject in medicine, but cannot have been published. They must be typewritten, and if written in a language other than English should be accompanied by an English translation, and must be received by the Secretary of the College on or before May 1, 1920.

Each essay must be sent without signature, but must be plainly marked with a motto and be accompanied by a sealed envelope having on its outside the motto of the paper and within the name and address of the author.

It is a condition of competition that the successful essay or a copy of it shall remain in possession of the College; other essays will be returned upon application within three months after the award.

No Alvarenga Prize for 1919 was awarded.

FRANCIS R. PACKARD, *Secretary*,  
19 South 22d Street  
Philadelphia, Pa.

STATE DEPARTMENT OF HEALTH.—The examination for the position of State District Health Officer and Epidemiologist for the Sub-division of Venereal Disease, originally set for July, but postponed, will be held on September 29 and 30, at 9 A.M., at the Civil Service Examination Room No. 15, State House, Boston.

B. W. CAREY, *Director*,  
Division of Communicable Diseases.

## SOCIETY NOTICES.

CONFERENCE ON MENTAL HYGIENE.—A meeting, under the auspices of the Massachusetts Society for Mental Hygiene, will be held at Municipal Hall, Pittsfield, Mass., Monday, September 29, at 4 P.M. Speakers: Frankwood E. Williams, M.D., William H. Burnham, Ph.D., John A. Houston, M.D., and A. W. Stearns, M.D.

NEW YORK AND NEW ENGLAND ASSOCIATION OF RAILWAY SURGEONS.—The twenty-eighth annual session of the New York and New England Association of Railway Surgeons will be held at the Hotel McAlpin, New York City, on Monday, October 20, 1919. A very interesting and attractive program has been arranged. A symposium on "The Modern Treatment of Infected Wounds" will be presented by leading surgeons, Railway surgeons, attorneys, and officials and all members of the medical profession are cordially invited to attend.

DR. J. S. HILL, *Pres.*,  
Bellows Falls, Vt.  
DR. GEORGE CHAFFEE, *Cor. Sec.*,  
Binghamton, N. Y.

## MARRIAGE.

DR. WILLIAM H. McBAIN married Miss May V. Powell on September 3, in the Sacred Heart Church of Malden. Dr. McBain is a graduate of Harvard Medical School and is assistant medical examiner and bacteriologist in Malden and has charge of the Contagious Hospital.

## RECENT DEATHS.

DR. JOSEPH A. KENEFICK died at the Lawrence Hospital on September 10. Dr. Kenefick was an ear and eye specialist and practised in New York City.

# The Boston Medical and Surgical Journal

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### THE ENERGY CONTENT OF EXTRA FOODS.

(Second paper.)

BY CORNELIA GOLAY BENEDICT, BOSTON,  
AND  
F. G. BENEDICT, BOSTON.

[From the Nutrition Laboratory of the Carnegie Institution of Washington, Boston, Massachusetts.]

In an earlier paper<sup>1</sup> we called attention to the importance of knowing the caloric content of cooked foods, particularly those served or taken away from the table and at other than regular meal times. The medical profession especially should, we believe, have its attention directed to the great significance and the extent of the calories in these extra foods, which are usually entirely disregarded in calculations of food eaten or food reported as eaten by the patient.

This present report deals with a group of materials very frequently eaten as extras, as incidental light meals, as ingredients of lunches, at picnics, spreads, and on automobile tours. We present herewith material dealing with olives and olive products, sardines, nuts, potato chips, doughnuts, confectionery (such as caramels, non-gatines, chocolate almonds, peppermints, etc.), and, in view of their extensive consumption by children, we have determined and report here

the caloric content of a large number of candies popularly sold under the name of "penny goods," that is, sold in portions costing one cent each. We likewise include partial reports on cream cheeses, popcorn, and crackers, including pretzels, and finally, with a full recognition of the utter disregard commonly shown the open sugar bowl as a source of calories, we report the average helpings of granulated sugar as measured by 17 members of the Nutrition Laboratory staff, as well as weights and sizes of various lump sugars. Sufficient evidence was presented in the first paper to show that very considerable amounts of energy are obtained in commonly served portions of these extra foods, as much as 500 calories, for example, being secured in a college ice or "sundae". Economic conditions have changed so rapidly that the actual cost per hundred calories or the number of calories for ten cents is at present only of secondary value. We still report certain cost values, however, fully recognizing that they are in no sense strictly comparable with values reported in our earlier paper, but feeling that they are not without significance as indicating the ease with which even children may secure a considerable number of calories at the cost of one cent.

The chief sources of information with regard to the caloric content of foods, namely, the government bulletins, deal for the most part with

the composition of uncooked materials and it is exceedingly difficult to use figures from these sources intelligently for the computation of the caloric content of various cooked foods, particularly those of a more or less complex nature. All of our data for the various materials studied have been based upon direct calorimetric measurements\* with the bomb calorimeter, the entire technique of which may be found in an earlier report from the Nutrition Laboratory.<sup>2</sup>

#### OLIVES AND OLIVE PRODUCTS.

Bottled olives are extensively used as extra foods. A modern innovation is ground olive pulp sold as "olive butter," which is commonly used in the preparation of sandwiches. The data with regard to olives and olive products are given in Table I. The cost at the time of purchasing, as here reported, can have relatively little comparative value. Olives are usually classified in the trade by size, and hence in this table, in addition to the weight per olive as purchased and the weight of edible portion per olive, *i.e.*, the weight less weight of pit, we have given, as a further index of size, the greatest length in millimeters and the greatest diameter in millimeters. The olives are listed primarily from the standpoint of size, from which it can be seen that the largest olives are not far from 32 millimeters long and 23 millimeters in greatest diameter, weighing with the pit from 9 to 13 grams, the edible portion weighing from 7 to 10 grams. The calories range from 1.147 per gram to 1.553 per gram. Special attention is called to the much higher caloric values per gram of the so-

called ripe olives, which range more nearly about 2.4 calories per gram, due to the extra fat in the ripe olive. In general, from 10 to 15 calories are obtained in each of the large olives. Small stuffed olives, which are commonly used, furnish a little over 4 calories per olive, while the ripe olives furnish from 8 to 10 calories, depending upon the weight of the edible portion. An average-sized olive, then, gives not far from 8 to 10 calories, extra large olives give 14 to 15 calories, and small olives, including stuffed olives, 4 or 5 calories. Olives are not a particularly economical source of energy and must be looked upon chiefly as appetizers. Olive butter furnishes approximately 10 calories for each level teaspoonful.

#### SARDINES.

Perhaps no one extra food is more commonly used at picnics, in automobile lunches, and for incidental meals than are sardines. While the war has almost completely shut off the supply of foreign sardines of the higher grades, American sardines have been extensively distributed and used throughout the country. The data with regard to sardines are reported in Table II. Although the various brands could by no means be exhausted, a sufficient number are included here to give representative samples. It is clear that the average sardine can contains not far from 100 grams of material. In two instances, both American make, 140 to 150 grams were found. In most instances free oil was found in the can, and this was poured out, weighed, and the caloric value computed from a standard factor. With four of the American sardines the oil was completely absorbed by the fish. It is obvious from comparing prices, weights of contents, calories per gram, etc., that with sardines

\*In the conduct of this research we have enjoyed the helpful assistance of Miss Marion L. Baker and Miss Mary D. Finn; to Miss Alice Johnson we are indebted for the determinations of nitrogen. It is a special pleasure to express our appreciation of the kind volunteer service of Mrs. S. C. Stickney, who assumed the responsibility for the verification of nearly all the computations.

TABLE I. OLIVES.

NAME	COST PER BOTTLER	NUMBER PER BOTTLER	AVG. SIZE—		WT. PER OLIVE—		CALORIES PER GRAM (POURABLE PORTIONS)	CALORIES PER OLIVE (POURABLE PORTIONS)
			Greatest Length	Greatest Diameter	As Purchased	Edible Portion		
	cents		cm.	cm.	gms.	gms.		
Spanish Queen .....	50	29	3.3	2.5	12.90	10.40	1.477	15.4
La Sevillana Queen (Mammoth) .....	45	28	3.2	2.3	11.39	8.93	1.553	13.9
Crown Queen .....	28	21	3.1	2.2	9.06	7.14	1.147	8.2
Spanish Olives .....	35	32	2.6	2.0	7.97	6.09	1.359	8.3
La Sevillana Queen .....	12	12	2.6	1.9	7.67	5.94	1.424	8.5
Stuffed Olivettes .....	25	33	1.8	1.6	2.98	2.98	1.866	5.6
Stuffed Olives .....	15	34	1.7	1.5	2.97	2.97	1.469	4.2
Ripe Olives (Sylmar Brand) .....	35	40	2.4	1.6	5.29	4.25	2.417	10.3
Munzanilla .....	13	20	2.1	1.6	4.76	3.66	2.452	9.0
Ehmann Ripe .....	45	102	2.0	1.7	4.10	3.21	2.398	7.7
Olive Butter .....	28	—	—	—	—	—	1.358	9.5*

\*Calories in 1 level teaspoonful. Total weight of contents in jar costing 28 cents is 112 grams.

TABLE II. SARDINES.

NAME	COST PER CAN	NUMBER PER CAN	WEIGHT OF CONTENTS	TOTAL CALORIES PER CAN	TOTAL PROTEIN PER CAN
	cents		gms.		gms.
<i>American</i>					
Arab Brand, Eastport, Me. . .	10	12	100.6	262	21
Avalon California Brand . . .	21	11	99.9	373	22
Fisher Queen, So. Portland, Me. . . . .	18	8	102.5	336	22
Tango Spiced, West Pembroke, Me. . . . .	20	8	147.8	397	26
Arrow Brand, So. Portland, Me. . . . .	15	10	83.1	311	15
Neptune, Eastport, Me. . . . .	12	12	109.2	286	21
Puritan American . . . . .	12	7	106.5	221	23
Rubidoux, Los Angeles, Cal. . .	18	14	115.9	397	25
Fried Brand, Rockland, Me. . .	15	6	90.3	261	17
Fried, Sunset Packing Co., West Pembroke, Me. . . . .	18	14	140.8	533	24
Pandora Brand, No. Lubec, Me. . . . .	15	26	94.1	379	15
<i>Foreign</i>					
Sea Lion, Norwegian Smoked, Stavanger, Norway . . . . .	30	30	106.6	514	24
Philippe & Canaud, Nantes, France . . . . .	40	—	103.6	485	21

as with practically all extra foods the price is by no means representative of the caloric content. Here, as elsewhere, one pays for delicacy of flavor and neatness of appearance of container and contents. What is of special interest is the fact that a can of imported sardines will yield not far from 500 calories, and that a can of American sardines will yield from 221 to 533 calories, the average sized can yielding not far from 300 calories. In these samples where the oil was separated from the fish, it was clear that a considerable portion of the caloric value was due to the oil present. The nitrogen content of sardines in the present days of nitrogen restriction and protein conservation, worthy of notice and certainly should be considered in computing the daily protein intake. As may be seen from the table the amount of protein in a can of sardines varies from 15 grams to 26 grams.

## NUTS.

The extensive use of nuts, particularly peanuts, as extra food and the frequent use on the dining table of small portions of nuts as appetizers, make a caloric study of these products of special interest. The values with regard to nuts are recorded in Table III. The high fat content of nuts accounts for the high caloric value, which runs in all cases not far from 7 calories per gram. In the case of all nuts other than peanuts the weight of each nut is between 1 and 2 grams, furnishing from 9 to 15 cal-

TABLE III. NUTS.

NAME	WEIGHT PER NUT	CALORIES PER GRAM	CALORIES PER NUT	PROTEIN PER 10 NUTS
	gms.			gms.
Salted Almonds . . . . .	1.39	7.537	10.5	3.6
Salted Filberts . . . . .	1.36	7.893	10.7	—
Salted Pecans . . . . .	1.16	7.066	8.9	1.0
Unsalted Walnuts . . . . .	1.90	7.737	14.7	2.8
Peanuts . . . . .	0.89*	7.016	6.2	2.5

\* Represents the weight of one kernel.

ories for each piece. Here again the protein content should not be neglected, although, save in the case of peanuts, but relatively small amounts of these nuts are commonly consumed. Still, the fact that one can obtain nearly 150 calories in 10 half-walnuts and 60 calories in 10 peanut kernels should not be overlooked in any computation of caloric intake.

## POTATO CHIPS.

In the eastern states, at least, a common form of serving potatoes is as so-called "potato chips," which are very thinly sliced potatoes, fried in fat, usually liberally salted, and sold in small pasteboard boxes. The two packages here analyzed and reported in Table IV weighed 88

TABLE IV. POTATO CHIPS.

COST PER BOX	WEIGHT PER BOX	CALORIES PER GRAM	TOTAL CALORIES PER BOX
cents	gms.		
18	88.3	6.161	544
15	126.8	5.628	714

and 127 grams respectively. Owing to the fat content the caloric value was high, on the average 5.9 calories per gram. The total calories per box were in these two instances 544 and 714 calories, respectively.

To obtain some estimate as to the probable average helping of potato chips, ten members of the laboratory staff independently weighed out what in their judgment was an average portion. This ranged from 10 to 28 grams, averaging 23 grams. Since the caloric value is not far from 5.9 calories per gram, there would be somewhat over 130 calories in one helping.

## DOUGHNUTS.

A characteristic American bakery product is the doughnut, which is prepared with sweetened quick-rising dough, fried in deep fat, thereby yielding a product which contains a considerable quantity of fat. The wide use of the doughnut, particularly in connection with the war, and its especial association with the extensive operations of the Salvation Army, has brought it into al-

most international importance. It has long been used in America extensively as part of a quick lunch and as an extra food. The data for six samples, which were purchased at different places, are included in Table V. At the time

TABLE V. DOUGHNUTS.

SAMPLE	WEIGHT PER DOUGHNUT gms.	CALORIES PER GRAM	TOTAL CALORIES PER DOUGHNUT
a	31.6	4.769	151
b	38.6	4.603	178
c	41.1	4.426	182
d	41.7	4.366	182
e	45.0	5.075	228
f	57.7	4.952	256

these doughnuts were purchased the cost price was practically the same for all, that is, 15 cents per half dozen. The weights vary from 32 to 58 grams. The caloric value per gram varies in all probability with the fat content, ranging from 4.4 to 5.1 calories. What is of special significance is, however, the fact that per doughnut the calories range from 151 to 256, averaging not far from 200 calories per doughnut. Even in these times of high prices it is quite obvious that the doughnut furnishes a large number of calories at a relatively low price.

## CRACKERS AND PRETZELS.

Supplementing our rather extended determinations of the caloric value of crackers published in our first paper, we report in Table VI four

TABLE VI. CRACKERS AND PRETZELS.

NAME	WEIGHT PER CRACKER gms.	CALORIES PER GRAM	TOTAL CALORIES PER CRACKER
Oyster Crackers	0.82	4.281	3.5
Educator Toastettes	3.05	4.278	13.1
Educator Wafers	2.69	4.172	11.2
Pretzels	4.87	3.885	18.9

more, including pretzels. The calories per gram are not far from the caloric value of starch, *i.e.*, 4.2 calories. Even the small, apparently insignificant oyster cracker furnishes 3.5 calories for each piece, and the pretzel 19 calories.\*

## CONFECTIONERY.

While in our early report we presented extensive data with regard to cake chocolate of various kinds, confectionery such as caramels, bonbons, nougates, etc., was not reported. With the special idea of emphasizing the caloric value of individual pieces of candy we have made a study of various types of caramels, chocolate-covered candies such as nougates, almonds,

\* In the report for macaroons in our first paper (BOSTON MEDICAL AND SURGICAL JOURNAL, 1918, Vol. CLXXV, Table II, p. 159) the calories were erroneously reported, inasmuch as they were determined upon the partially dried material. The true values should be 4.41 calories per gram, or 37.9 calories for an average macaroon weighing 8.5 grams.

peppermints, etc., two specimens of gum drops, one of marshmallow, one of cough drops, and three of mints, all of which are reported in Table VII herewith. It is obvious that manu-

TABLE VII. CONFECTIONERY.

NAME	COST PER POUND cents	WT. PER PIECE gms.	CALORIES PER GRAM	TOTAL CALORIES PER PIECE
<i>Caramels</i>				
Vanilla	50	11.53	4.171	48.1
"	100	11.10	4.471	49.6
"	50	11.44	4.216	48.2
Chocolate	50	10.86	4.437	48.2
"	100	10.95	4.965	54.4
"	50	10.77	4.154	44.7
Chocolate Layer	50	9.38	4.305	40.4
"	60	10.83	3.932	42.6
Chocolate Nut	50	11.28	4.455	50.3
"	50	10.32	4.727	48.8
<i>Chocolate-coated</i>				
Nougates	—	18.84	4.394	82.8
"	70	10.30	4.924	50.7
Chocolate Almonds	85	3.66	6.406	23.5
"	85	4.55	6.435	29.3
"	80	3.66	5.880	18.0
"	125	2.01	6.434	12.9
Chocolate Peppermints	85	12.01	4.505	54.1
"	12*	7.48	4.441	33.2
"	12†	8.65	4.613	39.9
"	65	10.00	4.403	44.0
"	100	11.60	4.333	50.3
<i>Miscellaneous</i>				
Marshmallows	60	4.10	3.266	13.4
Cream Mints	30	8.85	3.567	31.6
Chocolate Cream Mints	30	8.81	3.849	33.9
Canada Peppermints	40	3.34	3.925	13.1
U-All-No Mints	—	1.38	3.814	5.3
Gum Drops	45	9.43	3.459	32.6
"	40	11.10	3.270	36.3
Cough Drops	—	2.91	2.908	11.4

\* Cost per box, 12 in a box; † Cost per box, 11 in a box; ‡ 15 cents per package; § 5 cents per package, 16 in a package.

facturers of caramels have reasonably closely standardized their goods so that each individual caramel weighs not far from 9 to 11 grams, averaging very closely 11 grams. The caloric value is somewhat over four calories per gram, *i.e.*, above the heat of combustion of pure carbohydrates, and reflects to a certain extent the appreciable proportion of fat which is found in many caramels. Of special significance is the fact that with caramels from 40 to 54 calories per piece may be obtained, the average value being somewhat over 45 calories per caramel. Indeed, one or two samples were so difficult of aliquoting that they could not be satisfactorily burned owing to the fat, and it is quite likely that the average energy-value of high grade caramels would be represented by a round figure of 50 calories per piece.

The frequent use of chocolate as coating for

candies makes this particular form of confection very popular. Nougatines, chocolate almonds, and chocolate peppermints are perhaps those most commonly eaten. These different individual candies vary considerably in size, as the two lots of nougatines analyzed weighed on the average 10.3 and 18.8 grams per piece, respectively. Owing to the fat in the chocolate the caloric value of these chocolate-coated candies for the most part runs above four calories per gram, and depending upon the weight of the individual piece, we have calories per piece of candy ranging from 12.9 with the small chocolate almond to 82 with the large nougatine. From a comparison of prices it would appear that here again flavor and appearance are the dominating factors. It is important, however, to note that even with such a small bit of candy, as the chocolate almond, 13 calories may be obtained. With chocolate peppermints the individual pieces range from 7.5 to 12 grams, with a reasonably uniform caloric value of about 4.5 calories per gram, and from 33 to 54 calories per peppermint. It will be astonishing to many people to think that from 40 to 50 calories can be obtained from one chocolate peppermint.

A small group of miscellaneous candies, not easily classified, includes gum drops, cough drops, U-All-No mints, and marshmallows. Since but one of these miscellaneous candies contains chocolate, the caloric value per gram is for the most part four calories or under. The gum drops weigh not far from 10 grams each and furnish about 35 calories per piece. A popular after-dinner confection is the so-called "U-All-No mints," which weigh 1.4 grams per piece and furnish 5.3 calories. A widely advertised cough drop, which has been commonly used in large part as a confection, furnishes 11.4 calories for each piece. An individual marshmallow furnishes 13.4 calories, cream mints about 32 or 33 calories per piece, and the Canada peppermint 13 calories.

## PENNY CANDIES.

A large industry has been built up around the sale to children of portions of candy for one cent, under the technical name of "penny goods," in which candies ranging in number from one to eight or ten, depending upon the size, are sold for one cent. These candies go under various trade names which are given in Table VIII, but which in all probability have

TABLE VIII. PENNY CANDIES.

NAME	No. per cent	Wt. per piece, gms.	Calories per gram	Calories per cent
<i>Sugar</i>				
Candy Figs .....	1	20.1	3.386	68.1
American Figs .....	1	19.4	3.423	66.4
Licorice Bars .....	1	12.9	3.353	43.3
Monarch (licorice) Sticks .....	2	6.1	3.393	41.4
Stick Candy .....	1	15.9	3.717	59.1
Peppermint Sticks .....	1	11.5	3.715	42.5
Peppermints .....	2	4.7	3.648	34.1
Molasses Peppermints .....	3	4.5	3.761	50.9
Molasses Peppermint Ovals .....	5	4.6	3.827	88.0
Molasses Kisses .....	1	8.8	3.601	31.7
Molasses Candy (old-fashioned) .....	1	22.0	3.549	78.1
Suckers .....	1	19.1	3.983	76.1
Suckers .....	1	19.6	3.782	73.9
Lollypops .....	3	4.3	3.894	50.2
Lime Ovals .....	2	4.8	3.738	35.9
Skidoo Balls (Rovers?) .....	3	4.2	3.822	48.2
Jelly Beans .....	8	1.9	3.624	55.1
Primrose Mixture .....	6	1.7	3.855	39.3
Hoot Mon (caramels) .....	2	8.6	3.758	64.6
Whipped Cream Caramels .....	2	6.4	3.754	48.1
Assorted Caramels .....	3	4.1	3.765	46.3
Banana Caramels .....	2	12.5	3.743	93.6
Maple Cigar .....	1	18.3	3.653	60.9
Gibs (sugar candy, various flavors) .....	1	19.1	3.687	70.4
Marshmallows .....	1	6.7	3.716	24.9
Trimmers .....	10	1.2	3.973	49.3
Butter Scotch .....	1	14.6	3.630	53.0
Butter Caramels .....	2	10.5	3.697	77.6
Butter Daisies .....	6	1.5	3.740	33.7
Maple Crescent .....	1	11.5	4.175	48.0
Lozenges (Necco) .....	6	2.4	3.951	57.4
Nectar Cream Bar .....	1	19.1	3.932	75.1
Sen Sen .....	10	0.9	3.998	34.4
<i>Chocolate</i>				
Chocolate Peppermint .....	1	16.0	4.359	69.8
" .....	1	13.1	4.217	55.2
" .....	1	11.8	4.216	49.8
Old-fashioned Chocolate Cream .....	1	11.8	4.055	47.9
Sour Orange Chocolate Cream .....	1	12.9	4.040	52.1
Drake's Vanilla Cream .....	1	15.1	4.010	63.6
Chocolate and Maple Bar .....	1	13.0	4.048	52.6
Borden's Chocolate Squares .....	1	4.1	5.840	23.9
Chocolate Caramel .....	1	11.3	4.735	53.5
Bitter Sweet (vanilla) Chocolate .....	1	10.9	4.323	47.1
Fudge .....	1	18.8	3.599	67.7
Chocolate Marshmallow .....	1	10.5	4.122	43.3
Pluto (Bolster, chocolate covered molasses) .....	1	10.5	4.284	45.0
Waneta Chocolate Block .....	1	10.6	5.868	62.2
<i>Nut</i>				
Peanut Bar .....	1	17.5	5.893	103.1
Peanut Bar (Squirrel Brand) .....	1	16.9	5.883	99.4
Chocolate Peanut Bar .....	1	12.6	4.779	60.0
Peanut Caramels .....	2	8.1	3.825	62.1
Molasses Stick (Peanut butter filling) .....	1	23.4	3.640	85.0
Peach Blossoms (peanut filling) .....	2	3.9	4.066	36.4
Nougatine .....	1	11.4	4.580	52.2
" .....	1	10.4	4.436	45.8
Cocoanut Bar .....	1	15.7	4.099	64.4
Ko Ko .....	2	10.7	4.048	85.6
Cocoanut Almonds .....	6	2.2	3.972	52.4
Sugar Almonds .....	1	9.4	4.330	40.7
Molasses Cocoanut .....	1	14.6	4.736	69.2
Snow Bar (cocoanut and sugar) .....	1	19.7	3.619	71.3
Nut Caramel Bar .....	1	16.1	4.283	70.6
Nut Taffy .....	1	23.5	4.007	108.3
Mary Janes (peanut molasses sticks) .....	1	12.8	4.585	58.7

more or less of a local significance. In classifying these materials a rough attempt has been made to keep the chocolate candies by themselves, owing to the fact that they should have a somewhat higher heat of combustion per gram due to the fat. Other than this, little logical classification may be made. The fantastic names selected by the manufacturers mean little except to the large army of small purchasers, and here again, in all probability, flavor plays some rôle in the selection, although it is not improbable that size and weight may not be without appeal. A careful analysis of this tabular presentation is hardly feasible, but it is important to note that the number of calories obtained for one cent is frequently very large. Thus in two instances over 100 calories may be obtained for one cent. By inspection one can see that not far from 50 to 60 calories are commonly secured in these penny goods for one cent. At the present retail price of refined sugar, approximately 10 cents per pound, there would be 45 grams of sugar for one cent, or not far from 180 calories. These candies undoubtedly contain some starch and occasionally the less expensive but equally nutritious glucose. On the whole, considering variety, flavor, and attractiveness, the penny candy cannot be said to be a seriously uneconomical source of energy for the small child.

#### POPCORN AND CHEESES.

Pulverized popcorn, more or less colored, and compressed with molasses or some other binding material into cakes, finds common use. One such sample was analyzed. Likewise two soft cheeses, one Philadelphia cream and one Neufchâtel, were analyzed. The data obtained are as follows:

*Popcorn Candy* (4 flavors): cost, 10 cents; 64.5 gms.; 4,030 cal. per gm.; 260 total cal.

*Philadelphia Cream Cheese*: cost, 15 cents; 77.1 gms.; 3,654 cal. per gm.; 282 cal. per cheese; 10 gms. protein per cheese.

*Neufchâtel Cheese*: cost, 8 cents; 68.5 gms.; 2,656 cal. per gm.; 141 cal. per cheese; 15 gms. protein per cheese.

In the cheeses the relatively large difference in the calories per gram of fresh material may be ascribed without doubt to the fat content, the cream cheese containing the larger proportion of fat.

#### THE OPEN SUGAR BOWL.

The tremendous increase in the consumption of refined sugar by American households has been the subject of much discussion. Economists

view refined sugar as a comparatively new and important source of caloric intake. Physicians are not undisturbed by the possibility of excessive sugar consumption resulting in an increase in the incidence of diabetes. It is a fact, however, to be reckoned with by all that the consumption of refined sugar is on a great increase. Although this has long been known, it is surprising that in the computation of various dietaries the sugar consumption, other than that used in the regular process of cooking, is only too frequently entirely disregarded. In fact, one of the most important nutrition studies ever carried out in America was reported with no reference whatsoever to sugar in the coffee, where subsequent inquiry showed that not inconsiderable amounts had been thus consumed. It is of relatively little value to compute the caloric intake of a meal, even if the calories for each ingredient are carefully known, if one disregards completely the calories used as sugar in coffee, tea, or chocolate, or on cereals, berries, fruit, and pie; and while we welcome all efforts to educate the American public to the significance of caloric intake and consider that the representation in menus of the caloric value of the various ingredients is of the highest import, until the caloric value of a teaspoonful of sugar is fully recognized, any computations must be liable to great error. What is true of sugar is unfortunately likewise true with regard to butter, and not infrequently bread. The ordinary pat of butter in the restaurant is cut so as to represent from 40 to 50 pats per pound, or not far from 9 to 11 grams per pat, so that one pat of itself may represent as high as 70 to 90 calories. It is, however, chiefly with the free use of sugar that our interest at present lies, since sugar plays such an important rôle in the manufacture of the various extra foods, candies, etc.

It is a comment upon the seriousness of purpose of intelligent teachers of domestic science, particularly cookery, to note the efforts they have made to specify the size of the various measurements used in domestic cookery. For example, a teaspoonful may be either level, rounding, or heaping, and these three adjectives are commonly used. To obtain some approximate idea of the average weight of a serving of sugar from the teaspoon and variations in size of teaspoons, 17 members of the Nutrition Laboratory staff kindly volunteered to bring from their respective homes a typical teaspoon and to



measure out what in his or her judgment was an average "spoonful of sugar." For this purpose the volunteers used (a) their own personal spoons, (b) a so-called standardized "kitchen teaspoon" used for cooking and furnished by the laboratory, (c) a common so-called "sugar spoon," and (d) a silver teaspoon of presumably usual size. Each volunteer measured out three spoonfuls, which were weighed and then an average value per spoonful obtained. The individual variations in these measurements are clearly reflected in the values given in Table IX. It

TABLE IX. SUGAR MEASURED BY SPOONFULS BY 17 INDIVIDUALS.

SPOON	SUGAR PER 3 SPOONFULS		SUGAR PER SPOONFUL	CALORIES PER SPOONFUL
	(Range)	(Average)		
	gms.	gms.	gms.	
Volunteers' spoons.	40.6-19.3	25.9	8.6	34
Kitchen teaspoon ..	34.6-20.9	26.4	8.8	35
Sugar spoon .....	49.6-18.3	31.2	10.4	41
Silver teaspoon ....	30.7-15.7	22.1	7.4	29

would have been interesting to have attempted a correlation between the weight of sugar and the individual idiosyncrasies of the volunteer for or against sugar. That lies outside of our province. What is of greatest importance, however, is the fact that the average teaspoonful of sugar may weigh seven to nine grams and furnish 29 to 35 calories, and a hearty eater, who supplies two or three teaspoonfuls of sugar to his cup of coffee or an equivalent amount on his fruit or cereal, may add to his total caloric quota for the day 100 calories in each such helping. It is clear from an analysis of this table that there must no longer be an utter disregard of the open sugar bowl as a source of caloric intake.

Since much use is made of lump sugar in various forms, three kinds have been measured and weighed. These records, together with the calories per piece, are given in Table X, from

TABLE X. LUMP SUGAR.

NAME	SIZE mm.	WEIGHT	CALORIES
		PER LUMP gms.	
Domino (½ size) ..	25x12½x8	4.60	18
Jack Frost Tablet...	27x18x10	5.94	24
Cut .....	22x19x16	7.22	29

which it appears that each lump of sugar may represent, according to size, from 18 to 29 calories.

#### EXTRA CALORIES IN THE DAILY RATION.

While at first sight it would appear to be utterly immaterial in a total 24-hour caloric in-

take of from 2000 to 3000 calories whether or no one ate one caramel or whether or no 50 to 60 calories were taken in the form of this or that extra food, it is clear that even one doughnut is not to be neglected in such a computation, that the contents of a can of sardines are not without significance, and it should be thoroughly borne in mind that even one individual caramel plays a distinctly important rôle in the daily energy quota. When one realizes that a single caramel, a nougatine, or a penny's worth of candy may furnish sufficient calories to supply the extra heat needed for walking a mile or more, their energy content appears to be more worthy of consideration. To take a "constitutional" of two miles is a religious factor in the life of many individuals. That the extra energy required for this exercise may be derived from one-half of a large doughnut will certainly be news to many. The ingestion of three medium sized olives appears to be insignificant, and yet to increase the caloric output of the body by an equivalent amount of heat it would be necessary for the average man to walk half a mile. For a man of average weight to walk from the bottom to the top of the Washington Monument would require an extra heat production of 80 calories. The energy expended in this seemingly considerable bit of exercise may be completely replaced by the consumption of less than one half a doughnut, or six unsalted walnuts, or five large olives, or four pretzels. In the light of these comparisons it is illogical to disregard the energy content of these extra foods.

Finally, the caloric needs of the growing boy and girl, as reflected in their seemingly insatiable appetites—a common household experience—should not be underestimated. A recent analysis of the weights of children implied that every effort should be made to have children somewhat over- rather than underweight.<sup>3</sup> The common raids upon the kitchen pantry of the small child, if not of sufficient frequency to upset digestion, are not physiologically unsound. The active healthy child has usually an extraordinarily good digestion and needs large amounts of food.

#### REFERENCES.

- <sup>1</sup> Benedict and Benedict: BOSTON MEDICAL AND SURGICAL JOURNAL, 1918, Vol. CLXXIX, p. 153.
- <sup>2</sup> Benedict and Higgins: JOUR. AM. CHEM. SOC., 1910, Vol. XXXII, p. 461.
- <sup>3</sup> Benedict: BOSTON MEDICAL AND SURGICAL JOURNAL, 1919, Vol. CLXXX, p. 138.

## DIABETES MELLITUS.

BY STEPHEN H. BLODGETT, M.D., BOSTON.

I AM using the title diabetes mellitus in order that the article may be indexed under the commonly accepted heading; but I have contended for several years that there are usually included under this single name several functional and organic conditions which cause sugar (glucose) to appear in the urine.

I shall try in this article to consider the subject of sugar in the urine entirely from the practical standpoint of the physician to whom a case is presented for treatment.

First and foremost, given a patient in whose urine there is sugar, we must, in order that we may intelligently decide as to the proper diet, treatment, and prognosis of the case, first decide as to the cause or source of the improper metabolism which allows the sugar to appear in the urine. As an invaluable aid in accomplishing this I have used the classification which I first published in 1911.

Broadly, I would classify the various forms of so-called diabetes as due either to a functional disturbance of the liver or to an organic disturbance in the pancreas: the former for the sake of brevity I will speak of as the hepatic form, and the latter the pancreatic form.

We will first consider the various types found under the hepatic form.

## TYPE A.

This type is the most common, usually occurring in persons between thirty and sixty years of age. The patients are usually stout, very fond of food, and disposed to be what we often call "high livers," and to lead a more or less sedentary life. While they are taking an ordinary diet, there may be thirst, depending in degree on the amount of sugar present in the urine: the urine is apt to be increased in amount, though rarely running over 4,000 c.c. in twenty-four hours, with a specific gravity running from 1,028 to 1,040, and the sugar varying from 50 to 200 grams in twenty-four hours. There may be a very slight trace of albumen in the urine. Frequently you will find a very considerable number of large sized uric-acid crystals in the sediment, often some calcic oxalate crystals, and a few hyaline casts may also be present. The color of the urine will be normal; and it will usually be very strongly acid

Diacetic acid never shows in uncomplicated cases of this type, and it is only when they are complicated with the pathological conditions found in the pancreatic type that the diacetic acid will appear. Acetone rarely shows, and it so, only in the slightest trace. This particular type is more likely to occur in men than in women and the presence of the sugar in the urine is often discovered by accident, as during an examination for life insurance, etc.

It seems as though the patient's digestive apparatus, having been overloaded with carbohydrates for years, had stored up part of the excess as fat until the ability properly to take care of the excess of carbohydrates became impaired and sugar appeared in the urine.

In this type careful inquiry into the previous history will convince us that some of the symptoms have been present for several years, but not of sufficient intensity to cause any disturbance to the patient.

## TYPE B.

This type usually occurs in persons from fifty to seventy years of age, who are of ordinary build and have not indulged to an excessive extent in carbohydrates. There is frequently the added complication of gangrene of the toes, itching of the labia, boils or carbuncles, and in many of these cases a severe neuritis. The urine is ordinarily more normal in amount, rarely exceeding 2500 c.c. in twenty-four hours. There is no uric acid in the sediment and although the amount of sugar is less than in a case of the previously mentioned type, still it is harder to get the patient sugar free than in cases of Type A.

The treatment of cases of Type A and Type B is broadly the same. Later, under the subject of diet, I will go into the matter more fully. One difference I have noticed, however, is that cases of Type B will do better if in their permanent diet you will allow in each case all the uncooked fruit and raw milk that the patient can safely stand.

When you place these cases on the preliminary diet you will notice that the sugar disappears from the urine very rapidly and steadily in cases of Type A, but not quite so rapidly in cases of Type B, and in this latter type you may often be surprised to have the last 15 to 20 gms. of sugar remain in the urine for several days before entirely disappearing.

Prognosis.—Type A. Good if the patient can

and will remain on the proper diet. And let me say right here that a proper diet in Type A and Type B is one that will provide sufficient nourishment so that the patient can perform his allotted tasks properly. One that will be at least passably palatable and will sustain his body weight at the proper point, totally irrespective of the number of calories taken. In cases of Type A it is usually necessary to decide as to what should be the person's proper weight and then, by means of diet and exercise, get him gradually to that weight and keep him there.

Prognosis—Type B. Very fair, unless the complications are severe and the patient's condition has become undermined from other causes.

#### TYPE C.

This is often called "temporary glycosuria." The previous history of the case would never lead us to suspect the presence of sugar in the urine, there has been no marked thirst, no increase in the 24-hour amount of urine; the urine may show sugar present for several days and then absent for several days, depending somewhat on the amount of carbohydrates ingested. By care we may elicit a history somewhat as follows:

Patient has for some considerable time been under a constant mental strain and recently has been eating more carbohydrates in the form of candy or maple sugar than usual, or perhaps the patient is a person very much overweight. In these cases we may feel sure that we have by accident discovered a case that if it had progressed for a few years would have become a typical case of Type A.

Here the carbohydrate tolerance is very good and the prognosis is good if the patient is willing to remain on a slightly restricted diet and we can eliminate the cause of the worry.

#### TYPE D.

Under the hepatic form should be mentioned the types in which the initial impulse causing the sugar to appear in the urine lies outside of the liver, such as, for instance, pressure on the fourth ventricle. These cases are comparatively rare and are usually discovered only through routine examination of the urine. Cases of this class are often very puzzling to the physician, as all accompanying brain symptoms may be entirely absent; during the early part of the disease, at least, they are very slight. The physician is more or less at a loss regarding his diag-

nosis, and when, perhaps solely as a matter of routine, he examines the urine, he is greatly surprised to find sugar present; then he is very apt to think it is a case of diabetes, whereas the source of the trouble is in the brain, and the glycosuria is only a secondary occurrence.

Under this class should be placed glycosuria following cerebral hemorrhage, concussion of the brain, pressure from brain tumors or new growths, or cerebral edema: in fact, any process causing injury to, or pressure on, the fourth ventricle. It also includes most of the cases incorrectly named diabetes of central nervous origin.

The symptoms in these cases are often more or less indefinite, although in some cases the mental symptoms begin to show up very prominently in the early part of the disease. The urine is usually normal or decreased in amount; it is very apt to be pale, and of no very high specific gravity; it almost always shows some albumen, and sugar varying in amount from 10 to 75 grams in twenty-four hours; no diacetic acid is present, but at times acetone may be found. Physical examination of the liver and pancreas is negative. The prognosis depends entirely on the condition that causes the sugar and usually no dietetic treatment is necessary since the sugar will disappear from the urine if the condition in the head clears up.

Acute appendicitis may cause sugar to appear in the urine. From this cause it is present in only small amounts (5 to 50 grams) and immediately disappears following removal of the appendix or recovery from the acute condition. Prognosis good and diet need not be changed.

Cancer of the liver is frequently accompanied by sugar in the urine. The urine is decreased in amount and contains only small amounts of sugar (5 to 50 grams), but there is frequently a very great increase in the indoxyl. Prognosis is, of course, bad and there is no necessity for changing the diet.

Gall stones rarely cause sufficient disturbance in the liver to cause sugar to appear in the urine; when sugar appears due to this condition it is in very small amounts and disappears immediately after operation. Prognosis depends on the advisability of operation; there is no necessity of changing the diet. We now come to the forms that are characterized by an organic disturbance in the pancreas.

## TYPE 1.

Acute in onset, which may be so sudden that the mother of the patient may be able to tell on what particular night the intense thirst began. This type usually occurs in children, about 75% occurring between one and twenty years of age. It is very frequently preceded by an infection of the tonsils. There is intense thirst, frequent urination of large amounts of normal colored urine (2000 to 5000 c.c.) daily, high sp.gr. (1030 to 1050), large amount of sugar (150 to 900 grams) daily, and acetone, which is usually accompanied by diacetic acid. There is greatly increased appetite and a progressive loss of flesh.

The sugar is not so quickly or easily eliminated from the urine as in the hepatic forms, as it does not depend so absolutely on the carbohydrate content of the food. It is due to an infection of the pancreas entering usually through the tonsils. A clinical point well worth notice is that after the patient has been placed on a diet which allows the urine to be sugar free, suddenly, without any change of diet, if the patient has an infection of the tonsils, the pancreatic process will start into activity, sugar will reappear in the urine, and even if we are able to get the urine sugar free again the carbohydrate tolerance is permanently lowered. Prognosis bad in about 85% of the cases, as after one or two recurrent infections the process becomes rapidly and steadily progressive.

## TYPE 2.

This occurs in patients twenty to fifty years of age, onset less sudden, large amount of normal colored urine, great thirst, dry, cracked tongue, increased appetite with loss of flesh, odor of acetone on the breath. Four thousand to twenty thousand c.c. of urine and 250 to 1000 grams sugar daily, acetone and diacetic acid present. It is hard to eliminate all the sugar from the urine and there is the same peculiarity regarding the recurrence of sugar following any infection of the tonsils as was mentioned under Type 1. Prognosis bad within a year in about 40% of the cases and about half of the remaining 60% die from some intercurrent affection within a few years.

## TYPE 3.

This includes cases where sugar (not lactose) appears in the urine of pregnant women (these

must be carefully differentiated from cases where pregnancy occurs in women affected with some of the forms of so-called diabetes). I have placed these cases under the pancreatic form because I think that the faulty metabolism originates in the pancreas. There is no history of thirst, large amount of urine, etc., previous to the third month, at least. The amount of urine may vary from normal to 4000 c.c. (if large amount, the color is pale); the amount of sugar is usually less than 50 gms. Prognosis good, and no particular treatment is required except to restrict the amount of sugar, candy, and maple syrup until after labor.

With these various types of glycosuria in mind, let us consider the broad question of diet, as only by diet, at present at least, are we able to control this condition.

In regard to the cases which might be classified as temporary glycosuria (Type D), where the cause is pressure on the brain or inflamed appendix, etc., the original seat of the trouble should be sought and remedied, if possible, and very little attention need be paid to the diet.

As to the Types A and B, due to primary functional disturbance in the liver, which are perhaps the most common forms seen in practice, the diet plays the most important part; for it is because of improper diet continued for a long time that the function of the liver becomes deranged and sugar appears in the urine.

During the past two or three years the so-called "starvation" treatment has become very popular, more especially with physicians. I feel that this "starvation" treatment, as at present carried out, is to a large extent a serious mistake. For four or five years I have been using a diet (oftentimes with better results than have been obtained with strict "starvation" treatment) which has accomplished all the results sought, with no loss of strength to the patient, no unfavorable symptoms, no danger of coma (which sometimes happens during the strict application of the starvation treatment) and, what also must be considered from the patient's standpoint, with less discomfort.

There are certain broad rules that I use for my guidance as to diet in these cases. First, the carbohydrate tolerance, or ability to take carbohydrates without causing sugar to appear in the urine, varies with each individual case. Consequently the amount and kind of carbohydrate allowed in the diet must be determined for each individual patient. Then arrange the diet so

that this carbohydrate is given in the form most pleasing to that particular patient.

Also remember that the carbohydrate tolerance varies in each patient with different foods and does not follow absolutely the chemical analysis. For instance, one patient on a uniform diet will show no sugar in the urine when four ounces of potato are added to it, but will show sugar when one ounce of bread is substituted for the four ounces of potato; and another patient will show sugar when four ounces of potato are added to the diet, but no sugar when one ounce of bread is substituted for the four ounces of potato.

In hepatic glycosuria the tolerance for carbohydrates increases the longer the patient remains sugar free, but it does not increase, or only to a slight extent, in the pancreatic form.

The amount and kind of food necessary for each individual to enable him to carry on his work varies also very widely in a practical way, notwithstanding the theoretical teaching that 2500 calories, for instance, are enough for the ordinary business man. Enough food must be given to allow the patient to perform his allotted and necessary duties without too much discomfort.

Furthermore, due regard must be given to any gain or loss of weight. The normal weight for each individual should be determined early in the treatment and the patient brought to that weight (in many instances slowly) and held there. I consider the frequent use of the scale to determine the patient's weight a *very* important aid in determining the quantity and quality of the diet. In fact, I believe that the analysis of the urine as to sugar, the gain or loss of weight, and the patient's subjective symptoms are the three most important points in determining what he should eat.

Patients do better when they receive daily some green or uncooked food.

It has been my experience during the past twenty years that cases of glycosuria can be handled more easily and much more successfully in an institution where the kind and amount of food given and the output of urine can be watched accurately until the proper basic diet for that particular patient has been determined, and where, also, the patient does not see other articles of food which he is not allowed to eat. In fact, I am so firmly convinced of this that I will not accept cases for treatment unless they will enter some suitable hospital or sanitarium

and remain for the few weeks necessary to determine what is the proper diet for that particular case.

Often it can be decided, after talking for a few minutes with the patient, from what form of diabetes he is suffering. If, as is usual, it appears to be the hepatic type, I allow the patient to continue on his usual diet for twenty-four hours, so as to give me a basis in computing the reduction of sugar. After this preliminary twenty-four hours, the patient is placed on a diet approximately as follows:

*Breakfast*.—A half orange or a quarter grapefruit, one or two eggs, two Listers muffins with butter, one cup coffee.

*Dinner*.—Eight ounces of thin meat soup, one or two vegetables, two Listers muffins with butter, and water.

*Supper*.—Eight ounces of thin meat soup, one vegetable, three Listers muffins with butter, six olives or a small amount of cottage cheese, with a cup of weak tea if the patient wishes it.

In regard to vegetables, I let the patient select according to his individual taste, from the following list: lettuce, celery, asparagus, cucumber, spinach, dandelion, Swiss chard.

On this diet the sugar will entirely disappear from the urine in from one to three days. The rapidity with which it disappears is an added help in determining the type of glycosuria under treatment and also in determining the carbohydrate tolerance for that particular patient.

Forty-eight hours after the sugar has disappeared, I begin to make additions to the patient's diet, adding a saccharin dessert or a baked apple sweetened with saccharin, and if the sugar does not return after two days, I add a portion of meat or fish once a day. Two or three days after this addition, if no sugar has appeared in the urine, I increase slowly and cautiously the variety of vegetables, adding to the list string beans, green peas, cauliflower, cabbage, etc., and watching the urine each day after the addition of the food to see whether there is any return of sugar. In this way it is possible to tell how much and in what form it is best to give the patient the carbohydrates, and in the course of two or three weeks a normal basic diet for that particular patient is established on which he remains sugar free and yet is able to attend to his necessary tasks and still feel reasonably contented. After that, it is only a question of trying various articles of food which the patient craves. For instance, if

a patient is very fond of milk, I allow him, after determining his normal basic diet, to take six glasses of milk during twenty-four hours for two consecutive days. If no sugar appears, I permit him in the future to use at least two glasses of milk daily.

What I am trying to emphasize is the necessity to individualize cases and, in prescribing diets, to take into consideration the patient's habits, his ability to get various kinds of food, and his likes and dislikes.

A few general remarks in regard to various forms of bread may not be amiss. I have tried practically every kind of bread, more especially the so-called gluten breads, and also the various flours. It is almost impossible for a patient to continue for any length of time without something in the nature of bread. The gluten flour contains at least 20 per cent. carbohydrate, many of them very much more; and while they are a great advance from the ordinary wheat bread, still they are comparatively rich in carbohydrate.

During the past three years there has been put on the market a flour that contains less than one per cent. carbohydrate and which makes a very palatable biscuit. It is Listers flour. By the use of biscuits made from this flour, the patients are allowed bread and a great deal more latitude in the choice and amount of vegetables. I feel that the availability of a flour of this analysis has done more to aid the treatment of cases of so-called diabetes than any other one thing.

The question of automobile riding is asked by almost every patient. With some there is a return of sugar after a fifty mile ride, and with others we do not get any return after a three hundred mile ride. Therefore, if this question is asked, I advise the patient, after being placed on his basic diet, to try riding fifty miles. The urine excreted during the eight hours after the return from the ride is examined, and if sugar appears the automobile riding is advised against. If none appears the patient is advised to take a longer ride, say two hundred and fifty miles, and the urine for the next twenty-four hours is carefully examined for sugar. If after this ride no sugar appears in the urine I feel safe in allowing the patient to ride 50 miles a day.

If from the history of the case, it appears probable that it is of the pancreatic form, I prescribe somewhat the same diet as outlined above, except I restrict the amount of butter,

but I do not expect the sugar to disappear as quickly as in the cases of the hepatic form. If there is decided emaciation and the history shows the case to be one of rapid progress, I give a much more liberal diet and consult, to a large extent, the patient's comfort, knowing that when the process in the pancreas has progressed to a considerable extent, a strict diet will at the most only prolong life for a few days, with corresponding discomfort for the patient, and may even, instead of prolonging life, hasten the coming of coma and death.

I wish to emphasize a warning here against placing a patient who is much emaciated and far advanced in the disease, on a very strict or so-called "starvation" diet, as this will very likely cause fatal coma to appear within a short time. Rather these patients should be allowed within a short time considerable quantities of fresh fruits.

If, after two or three days, the sugar disappears entirely from the urine, I then very cautiously and slowly (much more so than in the liver form) increase the amount and quality of the food, cautiously trying other vegetables. In this form the carbohydrate tolerance never increases to any extent. In fact, if we can keep it from decreasing, we ought to feel very well satisfied.

If the patient is troubled with the formation of gas in the small intestine and shows an increase of indoxyl in the urine, I give him bulgarian bacillus or buttermilk.

Many times patients become constipated when placed on a restricted diet. If they do not defecate normally after three days, soap and water enema is given and repeated, if necessary, every three days. But as soon as the patient's tolerance has been determined, I try to add enough bulky food to ensure a normal daily passage. In many badly constipated cases, especially of the hepatic form, biscuits made of half bran and half Listers flour may be used.

As to saccherine, I will state, after having constantly used this sugar substitute in some cases for twenty years, that I have never seen it cause any ill effects. My experience has led me to consider it a most useful adjunct in the treatment of cases of glycosuria, as its use allows many patients to satisfy their great craving for something sweet without partaking of carbohydrate, and consequently makes it much easier to remain on a suitable diet.

In closing, I would say: discover, if possible,

from which form of the condition called diabetes the patient is suffering; remove the cause, if it can be discovered (and it frequently can), and then treat each individual patient according to his likes and dislikes for various articles of food, his ability and willingness to follow a certain diet, and his strength and his weight. In other words, individualize each case. Don't, when a patient comes to you with sugar in the urine, think you have given him proper attention by handing him a slip of paper containing a list of foods labeled "may take" and "must not take," with orders to follow that; and don't put every case to bed on a water and brandy (so called "starvation") diet for two to six days, then through a course of thrice boiled green vegetables, next five per cent. vegetables, next, if still sugar free, ten per cent. vegetables, and after that a diet containing 2505 calories, and while looking wise and scientific, explaining that 2500 calories are enough and you have added five extra for good measure.

## MEDICAL SUPERVISION OF FRAMINGHAM SCHOOLS.

By WILLARD ROYDEN HOWES, FRAMINGHAM, MASS.

WE have come to know that health is as much a national resource as coal mines or waterfalls, and as such should be protected and fostered in every way possible if we are to approach this greatest of all conservation problems with the perspective of modern conservation methods.

Disease has decreased just so far as we have come to know the causes and conditions influencing the viability of disease, just so far as we have been able by education, law, and economic adjustment to induce people to take advantage of our findings which make for their own personal safety and comfort.

Education is the greatest factor influencing disease control and health conservation. The earlier in life we can learn the fundamental principles which tend to guide us in the paths of health, the more effective and useful will be this acquired knowledge. Of all the channels that are being used to get health propaganda before the people, there is no greater opportunity nor more logical field for effective educational health endeavor than in our public schools.

Children spend from eight to twelve years during their developmental stage in schools and should receive the medical supervision and instruction during this school period which will make for health. It is just as important for a child to know how to preserve his health, to appreciate the value of sound teeth and good posture, as it is that he should know the capitals of the New England States, or how much tobacco Connecticut raises per acre. The public school is the place where the child will acquire this knowledge if it is to be obtained in time to be of real value to him in the battle for personal health and physical fitness. This knowledge will, in a measure, give the child an opportunity to influence his own hygienic environment and will allow him to avoid some unmistakable disease-producing practices which otherwise would be adumbrated by less important subjects.

Industry has learned from experience that it pays for pecuniary reasons to keep its employees in the best physical condition possible.

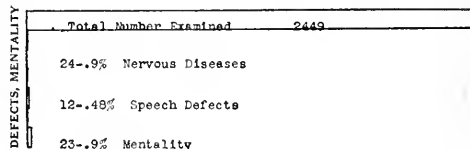
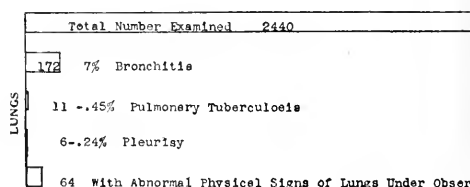
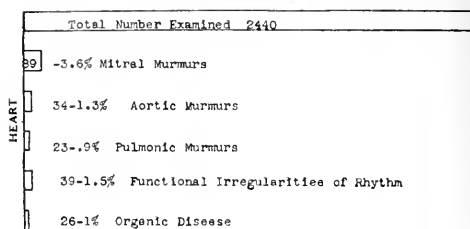
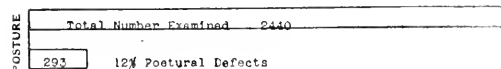
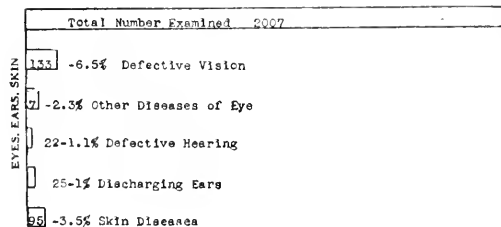
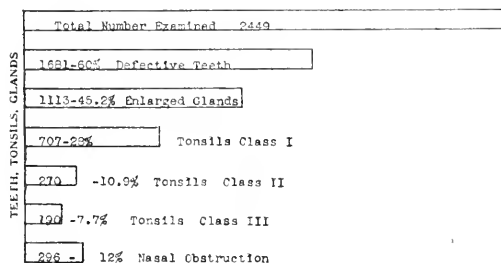
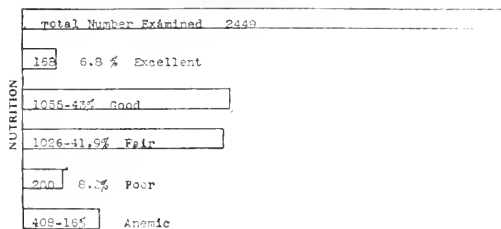
The day is not far distant when our school committees will deem it their duty to graduate from public schools under their jurisdiction children equipped physically as well as mentally to cope with the problems and responsibilities of post commencement life.

We are compelling every child by law to have a bill of health when he leaves our schools to go to work, but we are doing very little toward furnishing him with the necessary physical qualifications while he is preparing for work. There is no sadder sight than a boy with a diploma in his possession, lacking the physical energy to put his hard earned knowledge to work.

If we could but include the proper instruction and medical supervision in the curricula of our schools a very great economic waste would be prevented, along with the misery and disappointment which inevitably accompanies physical weakness and disease.

A great stride in preventive medicine will have been realized when the school children of the land receive the medical consideration which the school alone can and should give.

Framingham is attempting to solve its school health problem and undoubtedly has the best school health machinery in the State. The staff consists of a full-time school physician, nurse, dental hygienist, teacher of posture training, physical training teacher, and a part time den-



tist, for a unit of approximately 2,500 grade school children. A complete physical survey of the school population, the results of which are given in detail below, give some idea of the immediate need for corrective health measures, as well as preventive instruction. Future surveys will show how effective this school health machinery has been in dealing with existing conditions.

#### RESULTS OF THE PHYSICAL SURVEY.

##### NUTRITION.

The subject of nutrition, because of the war and food regulation, has been given more thought than formerly. Any scale of nutrition which we may adopt for a guide will be more or less elastic; the personal equation also must

be considered. A scale of nutrition similar to that of Dr. Mackenzie of Dunfermline was arranged using four groupings, Excellent, Good, Fair, Poor.

*Excellent*, nutrition above the normal healthy child, every objective sign indicating bodily vigor with evidence of perfect metabolic processes.

*Good*, includes those who fail to reach the excellent standard yet are well nourished normal healthy children.

*Fair*, borderline cases, who are below par and require watching and corrective suggestions.

*Poor*, cases with marked signs of mal-nutrition requiring medical supervision.

Of the 2,449 children examined 168 or 6.8%



were classified as excellent, 1.055 or 43% good, 1.026 or 41.6% fair, 200 or 8.2% poor.

#### ANEMIA.

408 or 16.1% of all children were found to be anemic. All children who were classified under poor nutrition were anemic. The degree of anemia was not serious except in four cases.

#### HYPERTROPHIED CERVICAL GLANDS.

1,113 or 45.2% had enlarged cervical lymph nodes varying in size from a buckshot to a walnut. Of this number only 36 or 1.2% were considered pathological. The majority of these minor cases are probably secondary to carious teeth.

#### HYPERTROPHIED TONSILS.

The degree of enlargement of tonsils varies to such an extent that they were classified under three groupings.

Group I.—Slightly enlarged tonsils protruding beyond the faucial pillars with no evidence of history of giving serious trouble, free from secondary cervical glands.

Group II.—Tonsils of considerable size, smooth, without crypts, no marked involvement of cervical lymphatics, negative history.

Group III.—Markedly enlarged tonsils or tonsils with history of frequent attacks of tonsillitis or peritonsillar abscess with crypts or pockets for the lodgment of bacteria, enlarged cervical glands.

1,167 or 46% were found to have hypertrophied tonsils of varying degrees: 707 or 28% were in Group I, 270 or 10.9% in Group II, 190 or 7.7% in Group III. All those falling in the third group were considered in need of immediate operation and parents were notified accordingly. It will be interesting to note from subsequent examinations what changes take place in those cases falling in the first two groupings.

#### NASAL OBSTRUCTION.

Two hundred and ninety-six or 12% with defective nasal breathing due to nasal obstruction from hypertrophied turbinates, adenoids, or injury to the nose were found.

#### DEFECTIVE VISION, HEARING, AND DISCHARGING EARS.

Number of children with eyes testing 20/40 or worse, 133 or 6.5%. This does not include the first grade scholars.

47 or 2.3% with other diseases of the eye.

22 or 1.1% defective hearing, whispered voice test of twenty-five feet.

25 or 1% with discharging ears.

#### HEART DEFECTS.

That heart murmurs are not uncommon in children is shown by the following percentages, mitral murmurs 89 or 3.6%, aortic 34 or 1.3%, pulmonic 23 or .9%, functional irregularities of rhythm 39 or 1.5%.

Of this number 26 or 1% present signs of organic disease.

#### LUNGS.

With a thorough examination of the lungs with children stripped to the waist, 11 or .45% cases of pulmonary tuberculosis were found; 64 other children with a history and abnormal physical signs in the chest which suggest possible tubercle were noted. These children are being kept under observation. Some of these cases will doubtless fall in the T. B. group.

One hundred and seventy-two or 6.9% of the children examined were found to have bronchitis and 6 or 2.4% cases of pleurisy were diagnosed.

#### SKIN DISEASES.

Of the skin diseases impetigo contagiosa held first place with 29 or 1.1% with pustular dermatitis, eczema, acne, scabies, ringworm, ichthyosis, following in the above order. One case of ichthyosis congenita, a rare skin affection, was diagnosed.

#### TEETH.

We are beginning to recognize the etiological rôle the teeth are playing in disease and their far reaching effects. Studies of the last decade with the aid of the x-ray have shown that teeth harboring the activating agents are frequently responsible for many of the cardiac, kidney, joint, nerve, and sinus diseases. In children we cannot think of the developing teeth without being reminded that their influence upon the contour of the face, floor of the nares, sinus development, and consequently resonance and quality of the voice are far reaching.

Dr. Wright of Harvard has proved conclusively that contagious diseases are less frequent in children whose teeth are in perfect condition and whose mouths receive the proper hygienic consideration. Carious teeth provide a splendid habitat for disease-producing germs, therefore the elimination of these culture fields gives one less source of infection and portal of entry.

TABLE SHOWING THE PREVALENCE OF CERTAIN PHYSICAL DEFECTS IN DIFFERENT AGE GROUPS.

	5-10 YEARS	PER CENT.	10-15 YEARS	PER CENT.	15+ YEARS	PER CENT.	TOTAL	PER CENT.
Nutrition Excellent . . .	50	4.6	104	7.9	14	15.5	168	6.8
Nutrition Good . . . . .	430	40.0	596	45.0	29	54.4	1055	43.0
Nutrition Fair . . . . .	491	45.7	511	39.0	24	26.6	1026	41.9
Nutrition Poor . . . . .	103	9.5	94	7.2	3	3.3	200	8.2
Anemic . . . . .	206	19.0	192	14.7	10	11.1	408	16.1
Enlarged Glands . . . . .	803	74.7	695	52.6	30	33.3	1113	45.2
Tonsils, Class I. . . . .	377	35.1	318	24.0	12	13.3	707	28.0
Tonsils, Class II. . . . .	147	13.6	119	9.1	4	4.4	270	10.9
Tonsils, Class III. . . . .	78	7.3	105	8.2	7	7.7	190	7.7
Enlarged Thyroid . . . . .			7	.46			7	.12
Mitral Murmurs . . . . .	38	3.5	46	3.5	5	5.5	89	3.6
Aortic Murmurs . . . . .	10	.9	22	1.7	2	2.2	34	1.3
Pulmonic Murmurs . . . . .	10	.9	13	.92			23	.9
Irregularities of Rhythm . . . . .	12	1.1	17	1.3			39	1.5
Pulmonary Tuberculosis . . . . .	4	.3	7	.46			11	.44
Bronchitis . . . . .	93	8.7	76	5.8	3	3.3	172	6.9
Pleurisy . . . . .			6	.4			6	.22
Stoop Shoulders . . . . .	26	2.5	267	20.4			293	12.0
Lateral Curvatures . . . . .	9	.8	14	.9			23	.85
Pigeon Breasted . . . . .	13	1.1	16	1.6			29	1.1
Post Infantile Paralysis . . . . .	3	.27	6	.4	2	2.2	11	.44
Rachitic Type . . . . .	25	2.3	19	1.4			44	1.7
Defective Vision . . . . .	42	3.8	89	6.8	2	2.2	133	6.5
Defective Hearing . . . . .	4	.3	14	.9	4	4.4	22	1.1
Discharging Ears . . . . .	7	.57	17	1.3	1	1.1	25	1.0
Conjunctivitis . . . . .	7	.57	3	.2			10	.38
Styes . . . . .	1	.09	4	.23	1	1.1	6	.22
Blepharitis . . . . .	15	1.4	7	.46			22	.8
Strabismus . . . . .	5	.45	1	.07			6	.22
Keratitis . . . . .			3	.2			3	.11
Nasal Obstruction . . . . .	171	15.0	120	9.1	5	5.5	296	12.0
Atrophic Rhinitis, ozena . . . . .			2	.11			2	.07
Defective Palate . . . . .	2	.15	2	.11			4	.15
Defective teeth . . . . .	883	82.0	779	59.0	19	21.1	1681	60.0
Pustular Dermatitis . . . . .	3	.3	6	.4	3	3.3	13	.5
Impetigo Contagiosa . . . . .	20	1.8	9	.6			29	1.1
Eczema . . . . .	3	.27	8	.47			11	.44
Aene . . . . .			5	.34	4	4.4	9	.35
Ichthyosis . . . . .	3	.27	2	.11			5	.2
Ichthyosis Congenita . . . . .	1	.09					1	.03
Herpes Simplex . . . . .	2	.18	2	.11			4	.15
Favus . . . . .			2	.11			2	.07
Tonsillitis . . . . .	4	.35	6	.45			10	.4
Ringworm . . . . .	4	.3	3	.2			7	.21
Scabies . . . . .	4	.3	4	.23			8	.22
Schorrhea Sicca . . . . .	1	.09	2	.11			3	.12
Poison Ivy . . . . .	3	.27					3	.12
Pediculosis . . . . .	56	5.4	40	3.0			96	3.9
New Growths . . . . .	2	.15	1	.11			3	.12
Nervous Diseases . . . . .	12	1.1	12	.9			24	.9
Speech Defects . . . . .	6	.54	6	.45			12	.48
Mentality . . . . .	14	1.2	7	.46	1	1.1	23	.9
Pharyngitis . . . . .	6	.54	7	.46	2	2.2	15	.6
Tapeworm . . . . .			1	.06			1	.03
Appendicitis . . . . .	1	.09	1	.06			2	.08
T. B. Uter . . . . .			1	.06			1	.03
T. B. Radius . . . . .	1	.09					1	.03

One thousand six hundred and eighty-one or 60% were found to have teeth needing urgent attention. It is obvious that our dental clinic cannot hope to care for all these cases. Their most effective work will be along educational lines, by instruction in the classrooms on the care of the teeth, tooth brush drills, etc.

#### POSTURE TRAINING CLASSES.

That poor posture is a forerunner of many physical defects is fully established. In the developmental stage, posture is easily influenced. It is in the school between the ages of 9 and 15 that most marked changes of posture are noted.

Drs. Goldthwait, Brown, Mankell, and Osgood have shown the relation between posture, vis-

eroptosis, types of breathing, and general human efficiency. The child with poor posture is handicapped at the start.

Two hundred and ninety-three or 12% with marked postural defects were found, 23 of this number had distinct lateral curves, while 29 were rachitic, and 11 post-infantile paralysis cases.

The following table shows the prevalence of certain physical defects in different age groups, also totals for all children examined.

The charts show graphically the number and percentage of physical defects found for the total number of children examined.

### BEDSIDE RADIOGRAPHY WITH A NEW PORTABLE X-RAY APPARATUS. THE ARMY BEDSIDE X-RAY UNIT ADAPTED AS A PORTABLE APPARATUS FOR CIVILIAN PRACTICE.

By W. K. COFFIN, M.D., BOSTON.

*Roentgenologist, Psychopathic Hospital.*

#### ADVANTAGES OF BEDSIDE RADIOGRAPHY.

THE x-ray examination of bed-ridden patients in their own homes offers so many practical advantages that any improvement in portable apparatus should be of considerable interest to the medical profession.

Many persons are brought home following accidents and x-ray diagnosis is desired to determine the presence or absence of fracture or dislocation. Others, becoming ill at home, develop some serious condition in which the clinical diagnosis is not clear: x-ray findings might give the clue. For some of these patients a journey to an x-ray laboratory is out of the question; for others it is possible, but rather dangerous owing to the accompanying discomfort, exposure, and exhaustion. Bedside examination in the patients' homes would, of course, solve the problem.

#### NEGLECTED IN THE PAST.

Considering this fact, it is rather strange that bedside radiography has not come into wide and active usage while roentgenology, as a whole, has gone ahead by leaps and bounds. It has remained more or less dormant, with little change in apparatus, in methods and in popular demand. The explanation lies in two related rea-

sons,—the difficulty of making thoroughly satisfactory radiographs of thick parts of the body with previously existing portable apparatus, and the consequent necessity of charging fees which were beyond the ability of the average patient to pay. (Plates were spoiled, repeated trips from operator's office to patient's bedside were necessary, and, as the calls for bedside work were infrequent, much hurried preparation was needed. All these factors made bedside radiography expensive.) Despite this, there was a certain amount of it done and some very excellent plates made which are a tribute to the technical skill of the operators rather than to their apparatus.

#### THE ARMY BEDSIDE X-RAY UNIT.

The basis for the improvement to which I referred in my opening sentence is the so-called Army Bedside X-Ray Unit. This apparatus, the result of a series of conferences of x-ray manufacturers with physicists and roentgenologists appointed by the government, was introduced to the Army hospitals a trifle more than a year ago. It proved extremely satisfactory there and is now rapidly finding its way into civilian hospitals,—at least three of Boston's largest hospitals have recently added it to their equipment.

It took excellent plates of any part of the body with one exception,—stomachs in rapid peristalsis, where exposure had to be practically instantaneous. Plates of hips, spines, chests, skulls, and abdominal viscera except the stomach, were uniformly good. In fact, detail was better than with the large stationary machines, owing to the small focus of the radiator tube and to the fact that the focal area, prevented from heating noticeably by the radiator, retained its original smoothness of surface, thus cutting down the blurring due to scattered rays.

The Bedside Unit consists of a transformer and Coolidge filament circuit and control, enclosed in a cabinet on castors which also serves to support a tube holder. The unit must be used with the radiator type of Coolidge tube for these reasons,—the high-voltage x-ray producing current is alternating after it leaves the transformer; it must be made unidirectional before going through the tube; the Bedside Unit, for the sake of portability, dispenses with the bulky rectifier used on stationary machines for this purpose; the radiator Coolidge tube has the unique property of suppressing one phase of the alternating current, thus making it unidirectional.

The Bedside Unit differs from regular stationary interrupterless apparatus in having no rectifier; it differs from other portable apparatus in using a transformer instead of a high frequency coil. The advantage of the transformer over the coil is that, bulk for bulk, it will step-up a far larger current; moreover, more of the current is of the proper voltage for x-ray production and changes in the voltage cycle are not so rapidly fluctuating nor so extreme. The result is more power.

#### EXPERIENCE WITH BEDSIDE UNIT IN CAMP SHERMAN.

A convincing testimonial as to the ability of the Bedside Unit is furnished by our experience with it in the x-ray laboratory at Camp Sherman Base Hospital. During the influenza epidemic there and for a month afterwards the stationary apparatus was out of repair: during that time we did all the roentgenologic work for this camp of 35,000 men with the Bedside Unit. The results were satisfactory in every respect, except that plates of stomachs in rapid peristalsis would sometimes be blurred. Plates of thick parts, hip, spine, skull, chest and abdominal viscera, except stomach, as well as limbs in plaster casts, were quite as good as those previously taken with the large apparatus. In fact, detail was finer and outlines clearer, owing to the narrow, unroughened focus of the radiator tube. The chest plates were of particular interest as we had many pneumonia and empyema patients, usually dyspneic and frequently with respiratory rates as high as 50 per minute. However, with the Bedside Unit we were able to get a good plate in every instance and were forced to use intensifying screens only some half dozen times. In all the fluoroscopic work,—chest, gastro-intestinal and fracture,—illumination was excellent and outlines clear.

#### ADAPTATION OF ARMY BEDSIDE UNIT TO CIVILIAN PRACTICE.

But, good as this apparatus might be for ward work in a hospital, it was not, with its cabinet on castors, adapted to the needs of civilian bedside radiography; something was wanted that could be stowed away on the floor space of an automobile and that one man could handle and carry up flights of stairs.

Impressed as I was with the value of the Bedside Unit for bedside radiography, I set about converting it into a truly portable apparatus.

This I did by discarding the cabinet and its important feature, a tube holding device, in favor of a sectional tube stand that could be separated and carried in small compass and that was light. In addition I used the 30 instead of the 10 milliamper Coolidge radiator tube which the army unit was equipped with. Also I procured what was said to be a somewhat more powerful transformer than the original one. However, it was essentially the Army Bedside Unit with a sectional tube stand in place of the cabinet.

I have used this modified portable apparatus in, as yet, a limited number of cases, but in enough to say that it is easy to handle, can be carried in the floor space of a small touring car, and has apparently ample capacity for all classes of radiographic work.

At this point it should be stated that in the antero-posterior head views where extremely accurate positioning is required, some difficulty will be experienced, not through any fault of the apparatus but because it will be hard to get a sick, restless patient lying on a sagging uneven mattress to assume and maintain the exact angle of the head needed. Compression in kidney examination will not be so satisfactory on a mattress as on a hard table surface. Gastro-intestinal work will not be thoroughly done with this portable apparatus; too many accessories are needed. However, such patients as those mentioned will rarely need bedside x-ray examination: they are usually able to go to a laboratory.

#### CLINICAL APPLICATION OF BEDSIDE RADIOGRAPHY.

Let us consider in what conditions bedside radiography will presumably be of greatest value.

First, fractures and dislocations of the lower limbs, pelvis, spine, and skull: compound, very loose, or comminuted fractures of the upper limbs; fractures in infants, the aged, the anemic, or otherwise debilitated persons. Such patients are usually in more or less shock, which would be aggravated by the jostling of a journey to a laboratory. Infection, local in the compound fracture cases, general in the debilitated and aged, is a danger that should be minimized by maintaining the patient's resistance; bedside radiography allows this to be done.

Next come pulmonary infections, acute and chronic. In a clear cut case of lobar pneumonia with a definite crisis and no sequelae there is no particular point to an x-ray examination. How-

ever, not all cases are of this diagnostically satisfactory type. There are central pneumonias, broncho-pneumonias, localized inflammatory processes about the lung roots, infections of the large lymph nodes and small single or multiple areas of peribronchial infection that give little or no clue to their existence on physical examination. The patient is apt to be acutely sick, the history suggests pneumonia but the diagnosis is not positive and a general state of uncertainty and dissatisfaction prevails. X-ray examination makes diagnosis certain and allows an intelligent prognosis as to duration and outcome.

A more important class for whom bedside radiography should mean much is the definitely post-pneumonia. Usually the problem will be—Is there an empyema? The skilled examiner will, of course, usually detect a peripheral empyema but an interlobar pus collection is another matter; and experience during the influenza epidemic in army base hospitals where the x-ray was extensively employed proved that it was a decidedly common occurrence. Besides empyema, other conditions to be differentiated by radiographic examination are lung abscess, areas of broncho-pneumonia, unresolved lobar pneumonia, bronchiectasis and chronic bronchitis. Pericarditis with effusion and latent tuberculosis activated by the pneumonia will sometimes be found to explain the continued illness.

Pulmonary tuberculosis in and of itself will rarely come within the special field of bedside radiography; patients in whom there is any doubt as to diagnosis will usually be able to go to a laboratory. Rarely, miliary and pneumonic forms with negative sputa will be appropriate cases. More often the function of bedside radiography will be to rule out tuberculosis in the not infrequent patient with unexplained fever where typhoid with negative culture and Widal, septicemia, endocarditis, pyelitis, sub-phrenic abscess, and tuberculosis are all considered as possibilities. The patient is very sick, and accurate diagnosis within the shortest possible time is highly desirable; hence bedside radiography is particularly suited to such cases.

Another large group is that of focal infection. Arthritis and endocarditis are its commonest expressions. Patients with either one in the acute stage should not undergo any unnecessary exposure or make any needless exertion. Yet the determination of infected foci in teeth or sinuses is of the utmost importance and it should be done at once, not after the disease has fortunately

reached a temporarily quiescent state, for then permanent damage has been invited if not actually received. The wise course is to locate the focus as early as possible and eradicate it before the heart, joints, and physical stamina of the patient are seriously injured. Bedside radiography discloses root infection and diseased sinuses with no strain imposed on the patient.

In the cardiac group pericarditis with effusion or adhesions may be shown. It may prove of some value in broken compensation, less because of confirming or reversing diagnosis as to valve affected, than by disclosing extent of dilatation, congestion of bases, hydrothorax, emphysema, bronchitis and bronchiectasis, pericardial adhesions, obstruction to great vessels in mediastinum, etc., and thereby permitting the clinician more sharply to focus his treatment.

Osteomyelitis following trauma, or hemogenous, is another important field for bedside radiography. The patient is very sick and movement painful and perhaps dangerous. Bone detail is probably better with the radiator tube and portable transformer than with any other apparatus.

#### SUMMARY.

Bedside radiography, though offering the advantages of x-ray examination to patients bedridden at home or in hospitals without x-ray equipment, has been neglected in the past. This has been due to the difficulty of getting uniformly good plates with portable apparatus in existence hitherto, and to the consequent necessity of charging fees higher than the average patient could pay. Given a more powerful portable apparatus, then plates uniformly satisfactory could be obtained, fees could be lowered, and bedside radiography would become the active specialty that it should be.

The Army Bedside X-Ray Unit furnishes the basis for this desired portable apparatus. It consists of a transformer, a Coolidge filament circuit and control encased in a cabinet and a Coolidge radiator (self-rectifying) tube. It may be made over, and has been made over by the writer, into a truly portable apparatus by substituting a sectional tube stand for the bulky cabinet. This gives an apparatus that one man can carry up a flight of stairs and that can be easily stored away in the floor space of a touring car. It has ample power and gives exceptionally clear detail, thanks to the small, unroughened focal spot of the radiator Coolidge tube. Its advan-

tage over the previous portable coil outfits lies in its transformer, which, bulk for bulk, can step-up far more current than a coil.

The classes of cases for which bedside radiography with this new portable apparatus will be particularly applicable are fractures and dislocations, pneumonia, empyema, lung abscess, etc., tuberculosis rarely, acute arthritides and endocarditis for determining presence of infected foci in teeth or sinuses, in some cardiac conditions, and in osteomyelitis. It is not well adapted, nor necessary often, in stomach, intestinal, and renal work, though it may be used when essential.

### Book Reviews.

*A Manual of Gynecology.* By JOHN COOKE HIRST, M.D. Philadelphia and London: W. B. Saunders Company. 1918.

The subject matter presented in this volume is arranged by the author in the manner which has been used during a teaching experience of twenty years. It is intended to give a concise, accurate outline of the subject of gynecology without attempting to discuss it at length. For the student or undergraduate who seeks a basis on which to build, it will prove a help, because it describes methods of treatment which have been the result of practical experience and have met with success. One hundred and seventy-five illustrations are inserted in the text where it is felt that they are needed as assistance in making clear methods of examination, etc. The twenty-two chapters into which the book is divided comprise the following subject matter: Normal Pelvic Anatomy; Methods of Examination; Anomalies of Development; Diseases of the Vulva; Diseases of the Vagina; Abnormalities of the Cervix; The Uterus—Its Normal Position and Relations; Its Abnormalities of Position and Disease; Diseases of the Fallopian Tubes; Diseases of the Ovary; Diseases of the Peritoneum and Pelvic Connective Tissue; Abnormalities of Abdominal Wall; Injuries of Birth Canal and Their Repair; Pathological Sequelae of Childbirth; Diseases of the Urinary Tract, including Cystoscopy; Gonorrhea; Normal Menstruation and Its Abnormalities; Leukorrhea; Diseases of the Breast; Diseases of the Rectum; Electricity; X-Ray, Radium, Mesothorium, and Finsen Light; Endocrine Glands and their Extracts in Gynecology; General Technic of Gynecologic Surgery.

*Beverages and Their Adulteration.* By HARVEY W. WILEY, M.D. Philadelphia: P. Blakiston's Son & Company. 1919.

At a time when prohibition has become a subject of national consideration, this discussion of "Beverages and Their Adulteration" should be of particular interest. The origin, manufacture, and chemical composition of alcoholic beverages, both fermented and distilled, of fruit juices, soft drinks, and water, and of the so-called medicines which are in reality non-medicinal but alcoholic, are described. Water, the beverage most freely consumed, is considered in most detail; mineral waters, cider, grape juice, soda water, coffee, tea, cocoa, and chocolate, wine, beer, whisky, cordials, and liquors are analyzed, and the principal types of adulteration are exposed. A chapter dealing with alcoholic remedies enumerates the beverages which are offered to the public under the guise of medicinal preparations. In considering the beverages in common use, the author of this book deals only incidentally with the hygiene, physiology, and the ethical aspects involved in their consumption; his main purpose is merely to describe accurately the nature of these beverages in order that the American citizen may have some knowledge of what he drinks aside from the properties which are ascribed to beverages from the commercial standpoint.

*Principles of Bacteriology.* By ARTHUR A. EISENBERG, A.B., M.D. St. Louis: C. V. Mosby Company. 1919.

This volume is, with additions, a syllabus of lectures given to the nurses at St. Vincent's Charity and St. John's Hospitals, in Cleveland. The object of the author has been to place in the hands of nurses and laboratory assistants a textbook which, in a fairly simple manner, will incorporate many of the latest and established facts of bacteriology.

The book is divided into three sections and contains many interesting illustrations. Section 1, on General Bacteriology, contains a brief summary of the first conceptions of the transmission of disease from man to man; followed by general information about bacteria, their forms, destruction, theories in immunity, prophylaxis, and general bacteriological technique. Section 2 deals with Special Bacteriology, and numerous tests given in connection with the particular disease are enumerated and explained. Section 3 treats of Bacteria of Unknown Causes. At the end of the book there are a few words on general care of the laboratory, and a list of questions suitable for examination is added. In the chapter on history are briefly reviewed the prominent achievements of American bacteriologists. It is a concise statement of the principles of bacteriology.

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## AMERICAN RED CROSS TUBERCULOSIS WORK IN ITALY.

THE American Red Cross Commission for Tuberculosis in Italy has published recently a report showing the results of its endeavor to secure standards of international coöperation in the control of tuberculosis. Activities have been divided primarily into two fields, one of active and one of potential work. In the first group, the principal problems were provincial and communal organization, visiting nursing, school hygiene and child welfare; the latter included careful studies in certain allied problems for good public health and welfare.

It has been estimated that the number of deaths from tuberculosis in Italy increased from 51,959 in 1914 to 60,938 in 1916. At the present time, organized effort against tuberculosis has

only just been begun in Italy. The number of beds available for the tuberculous among soldiers and returned prisoners is 20,540, yet many of these beds remain unoccupied, partly because of Italian dislike for hospital care, the lack of knowledge about tuberculosis, and absence of military control after the men have been discharged from the army.

Italy has two strong health organizations, the Department of the Interior and the Army, and, in addition, two voluntary organizations through which attempts were made to establish international coöperation. It was decided that the American Red Cross could work most effectively in the provinces of Liguria, Umbria, Palermo, and the two provinces of the Island of Sardegna. For these districts charts were prepared of public health organization, anti-tuberculosis organization, child welfare organization, and school hygiene, which were suggested to the inhabitants as possible sources of help in their problem. The Italian people were open-minded and aware of the need which these plans supplied.

In Genova, a provincial organization was organized for the five districts, and a program was outlined to include dispensaries, visiting nursing, school hygiene, school nursing, hospitals, sanitation, and free use of laboratories. This voluntary organization operates in coöperation with government officials. A similar program was arranged for the region of Umbria.

In Sardegna, the plan was somewhat difficult. Provincial organizations were established in the two provinces of the island, united into an inter-provincial committee for the whole island.

In Palermo, in Sicily, still another plan was adopted. An anti-tuberculosis league was formed composed of the existing anti-tuberculosis associations, the Marine Hospital, the Children's Hospital, the Italian Red Cross, the Wilson Institute of Child Culture, representatives of the government, members at large elected from among the aldermen of the municipality, the Cardinal of the Roman Catholic Church, and the Allied Women's Clubs.

The chief power in this whole program against disease was organization, which had been practically unknown and untried in Italy. The same principles which had been applied to the larger groups were extended also into single circondarii and communes, where organization could be accomplished by individuals.

Another agent in public health work which was practically unknown in Italy was the public

health nurse. In order to secure immediate help for large numbers of sufferers, three schools were opened in Rome, in Genova, and in Palermo, to which only Italian students were admitted. The amount of hospital experience required varied with the school; the highest standard was fixed in Rome, where two years' hospital experience under war conditions was the minimum. A group of American nurses acted as teachers and consultants, directing the courses and putting them on a working basis. It is interesting to know that these American nurses were successful in their teaching; they were accepted immediately in the homes and their value was appreciated by the Italian physicians.

In organizing methods of improving school hygiene in Italy the work of the commission was carefully planned. Italy has three and one-half million registered school children between the ages of six and twelve, and an additional million unaccounted for in the school register. The plan for this work was to study by questionnaire the status of school hygiene in Italy; to check by personal visits the answers to this questionnaire; to secure, if possible, a physical examination of several thousand school children in different sections of the country for comparison; to assist in the correlation of the various excellent pieces of Italian work into a national program of child hygiene, to provide manuals for medical inspection and school instruction in hygiene, physical training, and infant hygiene; and to establish, if possible, one district on an ideal basis as a demonstration.

In child welfare work many problems were presented in Italy. A study was made of the pre-war status of children in Italy; of the situation which resulted from the war conditions and its effect upon the children; of the tasks of existing organizations for child welfare, and the effects of the war upon them; and of those people not directly concerned in child welfare work. It was found that although before the war child welfare work had been started in many centers, it had been neglected during the war emergency work. Visits were made by members of the Commission to most of the provinces in the North of Italy, to the Islands of Sicilia and Sardegna, to the Adriatic Coast, from Rimini to Tarento and to Napoli. It is to be regretted that the Child Welfare Section was not allowed sufficient time to put into operation any active work, although the ground-work of coöperation was laid in a number of localities.

#### MEDICAL CONFERENCE AT CANNES.

In a series of pamphlets issued by the League of Red Cross Societies, Geneva, Switzerland, reports of various sections of the medical conference have been outlined. Delegates from Great Britain, France, Italy, Japan, and the United States have indorsed the medical program for Red Cross coöperation in combating disease and promoting public health, believing that no other organization is so well prepared to undertake the development of measures for public health and sanitation, the welfare of children and mothers, the education and training of nurses, the control of tuberculosis, venereal diseases, malaria, and other infections and preventable diseases. During the war the Red Cross has proved itself to be an agency for good of unparalleled force and power; in time of peace the potential usefulness of the Red Cross in promoting health and preventing disease is unlimited. It has therefore been recommended that a Bureau of Health, with a Director and a State and an Advisory Council, be established in connection with the League of National Red Cross Societies. The organization is to be a voluntary agency, whose purpose is to strengthen and assist in every way possible other voluntary and national health and relief agencies.

The Bureau of Health of the Red Cross has submitted resolutions adopted by the conference held at Cannes, April 1 to 11, relating to preventive medicine, child welfare, tuberculosis, malaria, venereal diseases, and nursing. The report of the Section on Preventive Medicine considers briefly the broader questions concerning public health legislation and administration and several special topics of immediate importance. It is stated that in many countries there do not exist adequate measures for the improvement of the public health; in these places public sentiment must be educated to demand good public health laws, and efforts made by the Red Cross to initiate their enactment.

Among matters of public health administration, the registration of vital statistics and notification of certain infectious diseases, public health laboratories, public health nursing and visiting, and public health education should receive special consideration. Special problems which will present themselves are certain epidemic diseases,—such as cholera, plague, typhus, influenza, and yellow fever,—whose prevalence is so great that they become a problem of inter-



national proportions. Because of their significance in the prevention of tuberculosis, venereal diseases, malaria, and in child welfare, housing and town planning present important questions to be considered. As a means of improving the public health and preventing disease, public health laboratories must be established and all possible assistance, such as gifts of apparatus, funds, or furnishing assistants should be offered by the Red Cross. It is believed that typhus fever is such a serious menace that efforts to control and prevent its spread should be undertaken immediately.

The Report of the Section of Child Welfare outlines the measures to be undertaken for the wide extension and development of child welfare work. It is the children who feel most heavily the effects of all unfavorable hygienic, social, and economic conditions. The war has increased infant and child mortality; the health of many children who have survived has become greatly impaired because of improper food and neglect; and the war and recent epidemics have greatly increased the number of dependent children. It is of prime importance now (1) to save the infants yet to be born and to promote their health development; (2) to restore the health and make possible the normal growth and development of children who are now suffering from disease or defective nutrition, and to safeguard the health of those whose nutrition has not yet suffered; (3) to do something for the immediate needs of dependent children. Work relating to child welfare may be divided into six parts corresponding to the period of child life to which it is directed: eugenic considerations affecting the prospective parents, the pre-natal period, obstetrical care, supervision during the period from birth to school age, care and instruction during the school age, from six to fourteen or sixteen years, and attention to the health and development of children in the industrial period, from fourteen to eighteen years. In view of the child suffering, which has been particularly acute because of the war, the Section on Child Welfare urges the consideration of emergency action in this field.

The Report of the Section on Tuberculosis has recommended that dispensaries, furnished with laboratories and appropriate equipment and affording provision for early diagnosis, and having especially trained nurses who will carry into the homes of patients the necessary care, are one of the fundamental and

indispensable factors in controlling and preventing tuberculosis. There should be also provision for the inspection of school children, for hospital treatment, sanatorium care, and popular education regarding tuberculosis. Working and living conditions should be improved; measures should be adopted to prevent the transmission of tuberculosis through infected milk; open air schools should be constructed; there should be a closer coöperation between dispensaries, hospitals, and sanatoria, and more extended development of skilled social service under medical direction; suitable occupations should be provided for tuberculous people; and scientific research in the field of tuberculosis should be increased.

The Section on Malaria has recommended (1) that a Central Malaria Bureau, or Section, should be inaugurated as soon as possible as a part of any general organized scheme for work in this field; (2) that this Central Bureau or Section should seek, through the National Red Cross Societies, to enter into coöperative relations with national agencies for the control of malaria; (3) that it should keep in touch with the progress in malaria control in all countries, and make use of the achievements of each for the stimulation and guidance of all; (4) that as opportunity offers and means are available, it should coöperate with existing agencies in active measures for malaria control; (5) that a comprehensive study of the literature and of the geographical distribution of the disease be made; (6) that a series of telling demonstrations in the control of malaria be made; and (7) that all available information be collected and widely distributed.

The Report to the Conference by the Section of Venereal Diseases presents an outline of the work necessary in combating venereal diseases. The campaign must necessarily include measures for the protection of individuals not yet infected, for the elimination of conditions of environment favoring dissemination of venereal diseases, for the discovery, treatment, and control, where necessary, of individuals already infected, for accurate observations and recording of data relative to efforts to combat venereal diseases, for furthering research upon venereal disease infections, and for the demonstration of new methods and measures for education. Education in the nature of venereal diseases and methods of control should be provided for students, doctors, nurses, social workers,

moral and religious workers, legislative authorities, and the general public.

The Section on Nursing has recommended that the Central International Red Cross Bureau should include a nursing department, which should seek (1) to act as an intelligence center, to collect, analyze, and distribute information; (2) to undertake propaganda in countries where trained sick nursing and public health work are not at present fully developed; (3) to seek out in these countries suitable personnel for training both in sick nursing and in public health work, to advise and assist them to obtain the necessary training, and to return them to their own countries as pioneers; and (4) to arrange for conferences of representative nurses and health workers from all countries for the interchange of ideas.

These recommendations and resolutions presented at the Medical Conference held at Cannes serve to indicate the vast problems which the Red Cross will attempt to solve, and to outline the programs adopted by the various Sections for the promotion and development of Red Cross activities in the prevention of disease and the betterment of the general health and welfare of the people in all countries.

### JOHN COAKLEY LETTSON.

THE life of John Coakley Lettson, the founder of the first of all the medical societies of London, in the year 1773, and his place in the medical and social life of the Georgian period, has been admirably pictured in the presidential address delivered by Sir StClair Thomson before the Medical Society of London on October 6, 1917.

John Coakley Lettson was born in 1744 in the West Indies, into a family which could give him few advantages and little home influence. At the age of six, he was sent to England to a small Quaker school at Penketh, in Lancashire, where he remained until he was fourteen years of age, entering into sports which developed his physical vigor, his powers of observation, and his resourcefulness. He next went to Liverpool for a business training, but at the end of a year became apprenticed as a pupil to a surgeon and apothecary in Yorkshire. During

his five years under this master, Lettson acquired a love of learning, memory training, habits of work, and the faculty of managing patients.

At the age of twenty, Lettson started for London, without money and without friends, and studied medicine. After two years in a hospital there, he returned to the West Indies, where he practiced for a short time. Later he visited London, Edinburgh, and Leyden, where he received the degree of Doctor of Medicine in 1769. He settled ultimately in London, and by the time he had reached the age of forty, he had acquired the first practice as a physician in that city. He purchased a country house at Grove Hill, Camberwell, where he was visited by many distinguished foreigners. But Lettson's good, income, generously spent, was earned by constant hard work. It is recorded that at the age of twenty-three he seldom prescribed for fewer than fifty, and often for twice as many patients before breakfast. He mentions that for nineteen years he took no holiday, and spent a good part of his nights in a traveling coach. Yet in spite of his extensive practice, Lettson's life was filled with varied interests, and he rendered important public service as a philanthropist. In 1770, he founded the General Dispensary in Aldergate Street; he established the Sea Bathing Infirmary at Margate; he was an active member of the Philosophical Society; he was one of the founders of the Royal Humane Society; and the amelioration of the condition of the poor and helpless was his constant care. His interest in botany, agriculture, and fossils was keen. He was the author of "Naturalist's Companion," "Essay on the Effects of Heated and Stagnant Air," "Hints Respecting the Effects of Hard Drinking," "Hints Respecting the Chlorosis of Boarding Schools," three volumes of collected essays under the title, "Hints Designed to Promote Beneficence, Temperance, and Medical Science," and "Recollections of Dr. Rush." Among his scientific work may be mentioned "Reflections on the General Treatment and Cure of Fevers"; among his biographical works, "The Natural History of the Tea Table with Observations on Its Medical Qualities"; and of his work of popular and philanthropic nature, "Practice of Physick."

The many foreign honors which were bestowed upon Lettson give evidence of the respect in which his literary, philosophical, and

benevolent character was held. He had many friends in America, where he was regarded with high esteem. His judgment was held in such faith that he was entrusted with the selection and purchase of books for the Pennsylvania Hospital. He was the first to send Jenner's smallpox vaccine lymph across the Atlantic, and sent the vaccine of the mangel-wurzel to George Washington.

Lettson's varied interests and general culture, and his hospitable and cheerful character brought him into contact with many celebrated people. He was frequently received by King George III, listened to Pitt and Fox in the House of Commons, corresponded with George Washington, Benjamin Franklin, Erasmus Darwin, and Sir Charles Linne. It is with wonder that we review Lettson's enormous practice by day and night, his long coach journeys, his multifarious social engagements, his hospitable entertainments, his voluminous correspondence, and his extensive publications. Yet, in spite of his strenuous life, he lived to the age of three score years and ten. His health was excellent and his habits temperate. He was tall and delicately built, his face was strongly furrowed, his skin was of a dark yellow tint, and he wore the dress of the Quakers. His natural ability was good, to which he added great perseverance and industry. His memory was poor, which made it necessary for him to adopt methodical habits of work. Lettson's astuteness was remarkable, enabling him to earn a large income early in life and to continue it during many years. A hint as to his shrewdness is his approbation of the advice, "Please thy master, and above all, please thy mistress."

Although Lettson was a keen observer and a ready writer, he never made any noteworthy contribution to medical science. He received no great hospital appointment, and had no pupils to spread his fame. To his own personality, his sincerity, his great industry, and his direct influence upon his patients, may be attributed his professional success. Lettson made many friends and few enemies; his relations with his professional colleagues were cordial, and with his wife, most happy. His life was characterized by great vitality, activity, and humanity to the end. His death came swiftly, ten days after he had assisted at a post-mortem examination during which he remained for two hours in a cold room, and five days after a visit to his last patient.

## MEDICAL NOTES.

**LOOMIS SANATORIUM.**—The Loomis Sanatorium at Liberty, New York, is designed to care for tuberculous patients who have a good chance of recovering and for those who show some predisposition to the disease. During the year, three hundred and sixteen patients were admitted and three hundred and thirteen discharged. Of patients under treatment for more than a month, twenty-one died during the year.

The treatment at Loomis Sanatorium is based on the three following methods: (1) Dietetic hygienic treatment; (2) the employment of special measures, such as tuberculin, artificial pneumothorax and vaccines; and (3) the employment of graduated exercises for the purpose of producing controlled auto-reactions or "auto-inoculations." Tuberculin has been used in the past year as a therapeutic agent less frequently than in former years, and induced pneumothorax has been performed in a greater number of cases, with good results. The institution has been conservative in the employment of these therapeutic measures. The twenty-second annual report contains a detailed medical report of the tuberculous cases treated at the institution.

**THE DANGER FROM RATS.**—The United States Public Health Service has pointed out the seriousness of the rat menace, and has advocated state and municipal action and the passing of a rat-proofing law. Rats have transmitted bubonic plague to all parts of the world, until it now exists in English seaports, southern Europe, Africa, in practically all the ports of the Orient, and on the east and west coasts of South America. The rat has probably caused the loss of more lives and money than any other parasite.

Rats cannot be destroyed wholly by individual efforts; measures must be put into effect by entire communities. Trapping poisoning the use of natural enemies, such as cats and dogs, and care in preventing rats from gaining access to food will aid in destroying them; but the municipal government can greatly assist these efforts by the passing of rat-proofing laws. The Public Health Service has emphasized the importance of starving the rat, of using rat-proof receptacles for food, depriving him of breeding places through the abolition of plankled yards and passage-ways, of keeping him out of

buildings by rat-proof construction, and of demanding the passing and enforcing of anti rat laws.

**APPOINTMENT OF DR. SAMUEL T. ORTON.**—Dr. Samuel T. Orton, of the University of Pennsylvania Hospital, has been appointed head of the new psychopathic hospital at Iowa City. This institution is being erected at the cost of \$150,000.

**RED CROSS RELIEF TRAINS.**—Two special army trains carrying emergency supplies and a large detachment of relief workers have been sent to the hurricane stricken districts between Brownsville and Corpus Christi, Texas.

**VITAL STATISTICS OF FRANCE.**—Vital statistics reports have been suspended in France during the war; but the *Journal officiel* has recently published the following statistics for the years 1915, 1916, and 1917 of twenty-seven departments. These figures do not include the eleven invaded departments, in which the losses caused by the war have been approximately 1,400,000. The report for 1913 is given for comparison:

	BIRTHS	DEATHS
1913 .....	604,811	587,445
1914 .....	594,222	647,549
1915 .....	387,806	655,146
1916 .....	315,087	607,742
1917 .....	343,310	613,148

It is a matter to be gravely considered that while in 1913 the number of births exceeded the number of deaths by 17,366, the deaths in 1917 exceeded the births by 269,838.

**GRADUATE MEDICAL EDUCATION IN GREAT BRITAIN.**—A plan for developing graduate medical education in Great Britain has been announced in the *Journal of the American Medical Association*. It is hoped that the Government will support the project, which will require graduate teaching for the following classes: (1) Physicians in Great Britain who would like to spend a portion of their holidays in getting up to date in all branches of their work, or who wish to spend a few months in learning all they can about some particular subject in which they desire to specialize, either completely or in conjunction with general practice; (2) medical officers of the Royal Navy,

the Royal Army Corps, the Royal Air Force, and the Indian and Colonial Medical Services, who have to attend postgraduate courses at stated intervals; (3) graduates from British colonies, India and Egypt, including those who have recently qualified and wish to complete their medical education in England, and some senior men who fall into the same category as the men in Class 1; (4) graduates of allied countries, especially Americans, large numbers of whom have in the past studied in Germany and Austria, in many instances simply because they were unable to obtain equal facilities in England, as well as the French, who have hitherto rarely studied abroad, and the Japanese.

**MEDICAL SCHOLARSHIP FOR NEGROES.**—Six scholarships of twelve hundred dollars each have been offered by Julius Rosenwald of Chicago for negro graduates of American medical schools for post-graduate study in pathology, bacteriology, physiology, pharmacology, or physiologic chemistry. Appointments will be made in 1920 by a committee composed of the following men: Dr. William H. Welleh, Johns Hopkins School of Public Health, chairman; Dr. David L. Edsall, dean of the Harvard Medical School, and Dr. Victor C. Vaughan, dean of the medical department of the University of Michigan. Abraham Flexner, secretary of the general education board, will act as secretary of the committee.

**CONFERENCE OF WOMEN PHYSICIANS.**—A conference of women physicians, attended by representatives from thirty countries, began on September 15 in New York at the headquarters of the Young Women's Christian Association, and will continue for six weeks. The conference is an outgrowth of work conducted during the war by the social morality committee of the Y. W. C. A. war work council, and has been called for the study of social responsibility for public health. Dr. Anna L. Brown is chairman of the program committee.

#### BOSTON AND MASSACHUSETTS.

**WEEK'S DEATH RATE IN BOSTON.**—During the week ending September 13, the number of deaths reported was 191 against 219 last year, with a rate of 12.53 against 14.56 last year. There were 35 deaths under one year of age against 34 last year.

The number of cases of principal reportable

diseases were: Diphtheria, 26; scarlet fever, 27; measles, 6; whooping cough, 20; typhoid fever, 6; tuberculosis, 41.

Included in the above were the following cases of non-residents: Diphtheria, 4; scarlet fever, 4; whooping cough, 1; tuberculosis, 2.

Total deaths from these diseases were: Diphtheria, 2; measles, 1; whooping cough, 2; typhoid fever, 1; tuberculosis, 13.

Included in the above were the following non-residents: Diphtheria, 1; tuberculosis, 1.

Influenza cases, 11; deaths, 2. Last year (corresponding week): Cases, not reportable; deaths, 19.

**TUBERCULOSIS IN MASSACHUSETTS.**—In a recent *Public Health Report* there is an article discussing the tuberculosis problem in Massachusetts, where there are twenty thousand cases of this disease. The author has emphasized the value of rest in bed out of doors and has outlined the method of treatment which he has used as a basis of treatment in approximately two hundred cases. In many cases he found that six weeks of this treatment enabled a patient to return to work greatly improved. The author has recommended that a State correspondence class be formed by the State Department of Health, so simple is the technique of the bed-rest method. The patient should be admitted upon application, endorsed by a private or dispensary physician, the details of his daily life recorded, and reports made in writing to the director of the class at stated intervals. By this method a large number of patients could be benefited at a minimum expense, the patient could keep in contact with his physician and would be required to be examined at stated intervals, and even if he lived in a remote village, he could receive constant and intelligent supervision.

**FÊTE FOR HOSPITAL FUND.**—A garden fête was held at the Weston Golf Club on September 10 and 11, for the benefit of the American Memorial Hospital at Rheims. It was given under the auspices of the Weston branch of the American Society for French Wounded.

**LECTURES OF DR. THOMAS M. LEGGE.**—Dr. Thomas M. Legge, chief medical inspector of factories in Great Britain, will give a course of Lowell Lectures and the Cutter Lectures in

Preventive Medicine for the coming year. These lectures will be given under the auspices of the school of public health of Harvard University, the division of industrial hygiene, and the Massachusetts Institute of Technology. The first lecture will be given on November 18. The following subjects will be included in Dr. Legge's courses of lectures: "Twenty Years' Experience of the Notification of Industrial Disease," "Twelve Years' Experience of Workman's Compensation Act and Industrial Diseases," "Medical Supervision in Factories," "Industrial Poisons and Their Prevention," "Anthrax," "Fumes and Gases," "Industrial Fatigue," "Industry As a Subject for Art," "Manufacture under the Medieval Trade Guilds."

**ST. VINCENT'S HOSPITAL.**—Work has been begun on a new wing to be added to St. Vincent's Hospital in Worcester. The new ward will be of brick and steel, three stories high, and will be used to house the surgical ward and one hundred private room patients.

**SPRINGFIELD ACADEMY OF MEDICINE.**—The first meeting of the Springfield Academy of Medicine for the year 1919-1920 was held in Springfield on September 16. Dr. Walter E. Fernald, superintendent of the Massachusetts School for the Feeble Minded, delivered an address on "Our Changing Conceptions as to Those Citizens Who Are Only Partially Responsible."

**BETH ISRAEL HOSPITAL SITES.**—The Beth Israel Hospital Association has purchased two lots of land containing 8871 square feet and a single dwelling house of nine rooms and an adjoining lot, containing 4293 square feet, in Roxbury. These buildings will be remodelled at once for use as hospital quarters for incurable patients and those suffering from contagious diseases such as the city and state authorities will permit in that locality. The Beth Israel Hospital is the only Jewish hospital in New England and is supported by a Jewish community membership in Greater Boston of five thousand men and six thousand women. Four years ago, the Association purchased four acres of land, upon which were built a hospital and a nurses' home.

**DIPHTHERIA.**—The *Monthly Bulletin* of the Health Department of Boston has pointed out the fact that for the past four years there has been an average of over two hundred deaths a year from diphtheria in Boston. In spite of the fact that the causes of the diseases are understood, the modes of its transmission known, and means for controlling it available, diphtheria is tending to increase rather than diminish. Investigations have shown that probably sixty-five per cent. of deaths from diphtheria have occurred among children under six years of age, and twenty-three per cent. were ill at least a week before a physician was called. The *Bulletin* emphasizes the necessity of prompt and careful investigation of inflammatory conditions of the nose and throat in children, and urges physicians not to hesitate to take swab cultures from a child with a sore throat and even from all members of the family, although there may be present no clinical symptoms of the disease.

**GIFT TO INFANTS' HOSPITAL.**—The sum of six thousand dollars has been bequeathed to the permanent fund of the Infants' Hospital, Thomas Morgan Rotch Memorial Building, Boston, by the will of the late Clara Morgan Rotch of New Bedford.

**PLYMOUTH COUNTY HOSPITAL.**—The Plymouth County Hospital has been completed recently and will care for all cases of tuberculosis in the county which need hospital treatment. The cost of building and equipping this institution was approximately \$275,000.

#### NEW ENGLAND NOTES

**GIFTS TO HOSPITALS.**—By the will of the late David E. Murphy of Concord, N. H., the sum of five hundred dollars has been left to the Women's and Children's Memorial Hospital and to the Margaret Pillsbury General Hospital of Concord.

**RED CROSS FUNDS.**—It has been estimated that the sum of \$15,000,000 will need to be raised throughout the country in order to carry out the work already begun in supplying food, clothing, and medical aid in countries devastated by war and for continuing the health campaign. Of this amount, \$1,330,000 must be raised by New England. In order to strengthen the local chapters there will be a Red Cross roll call from November 2 to 11.

**WAR RELIEF FUNDS.**—The principal war relief funds of New England have reached the following amounts:

French Orphanage Fund ..	\$512,414.00
Italian War Relief Fund ..	302,429.17
Russian Refugee Fund ....	92,442.55

The American Fund for French Wounded, New England Branch, has received \$189,815 for the American Memorial Hospital at Rheims.

**NEW ENGLAND DENTAL SOCIETY.**—The twenty-fifth annual convention of the New England Dental Society was held recently at the Hotel Somerset in Boston, with an attendance of more than one hundred. Lectures and clinic demonstrations were given. Efforts were made by the officers and the executive committee to present a post-graduate course for its members upon the following three subjects: "Oral Surgery and Local Anesthesia," under the direction of Dr. Arthur E. Smith of Chicago, at the Harvard Dental School; "X-Ray Diagnosis and Technique," by Dr. Arthur E. Kinley, at the Forsyth Dental Infirmary; and "Prosthodontia," by Dr. William H. Heyt, at the Harvard Dental School. Lectures in these three courses were given every day during the convention.

#### Obituary.

##### CARL ADDISON ALLEN, M.D.

CARL ADDISON ALLEN, M.D., died at his home in Holyoke September 11, aged 71 years. Dr. Allen was born in Lempster, N. H., October 27, 1847, son of Stephen and Phebe (Lewis) Allen. His preparatory education was gained at Kimball Academy at Meriden, N. H., from which he was graduated in 1871. For a time he was principal of the Marlow (N. H.) academy and took up the study of medicine under the instruction of Dr. Marshall Perkins of that place. He attended a course of lectures in medicine at Bowdoin College, Brunswick, Me., and then entered Long Island College Hospital Medical School, from which he was graduated in 1874 with the degree of doctor of medicine.

For 15 years following his graduation he successfully practiced his profession at Asworth, N. H. While located there he served as super-

intendent of schools for 12 years, was editor of a local newspaper there, and interested in a number of industrial enterprises of that town. He was a member of the New Hampshire Medical Society, of the Massachusetts Medical Society, and of the Connecticut River Medical Society. Fraternally, he was affiliated with Holyoke Lodge of Odd Fellows and was a past grand master of that order. His church affiliations were with the Congregational denomination.

After a temporary breakdown, he abandoned his practice at Asworth and settled in Holyoke in 1890.

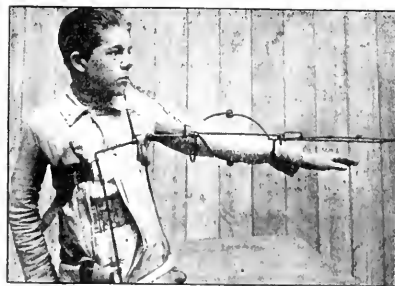
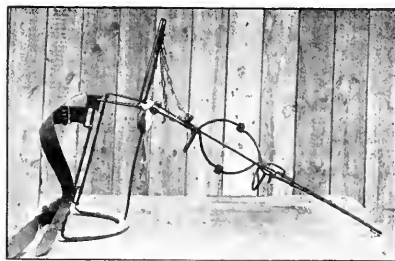
Although highly successful as a practicing physician, Dr. Allen was probably best known for his anti-tuberculosis work, fighting the ravages of the "white plague," the dread disease that ultimately claimed him. It was in 1906 that the Holyoke Society for the Prevention and Relief of Tuberculosis was organized, and Dr. Allen was made its first president. His interest in the welfare and success of this organization never ceased. In 1907 the work of the organization had grown to such proportions that it was a public movement, and the municipal sanatorium was dedicated in 1912. From the time he was first elected president of the local organization, February 22, 1903, he served in that office for ten consecutive years. His connection with the anti-tuberculosis movement extended beyond local confines and he was affiliated with the Massachusetts State Tuberculosis Association and the National Association for the Study and Prevention of Tuberculosis. Activities of the local organization began with the establishment of a day camp, but soon extended, through state enactment, to the establishment of a municipal tuberculosis hospital.

He was twice married. His first wife, married in 1875, was Sophie E. Stearns of Lebanon, N. H. Four children were born to this union: Walter S., now connected with the research department of the General Chemical Company of New York City; Dr. Fred H. Allen, who was associated with his father in the practice of medicine; Raymond P., paymaster at the Farr Alpacas Company's plant; and Sophie E., now engaged in secretarial work at Columbia University. His second wife was Hattie M. Murdough, of Asworth, N. H., married in 1891. Two children were born to this union, Cary M., who is with the General Chemical Company of New York, and Leland C., with the General Chemical Company of Holyoke.

## Miscellany.

### RED CROSS BASIC SPLINT.

Arm and leg wounds composed a large majority of the injuries received in battle, hence there was an enormous demand for splints—a



THE NEW ADJUSTABLE ABDUCTION ARM SPLINT FOR USE IN BASE HOSPITALS IN ARM FRACTURES, FOR THE PERFECTION OF WHICH THE AMERICAN RED CROSS SPLINT DEPARTMENT WAS LARGELY RESPONSIBLE. THE ADVANTAGES OF THIS SPLINT ARE THAT IT CAN BE USED ON EITHER ARM AND CAN BE ADJUSTED TO ANY POSITION.

framework upon which the injured member may rest in the most comfortable position.

Contrary to the layman's preconceived opinion of a splint, it is not a piece of wood, but, for the use of the American Army, was of steel framework with leather and felt padding; and most of them were of ingenious invention, being far from simple affairs. The types were almost as numerous as the injuries for which they were made to aid in healing.

The American Red Cross took over the job of supplying all splints to the American Expeditionary Forces, and in the vernacular of the streets, it was "some job."

Most of the leg and arm splints were made of steel rods bent in the shape of a U about four feet in length. They taper from the bottom up to the top, where a semi-circular steel rod, attached to each end of the U by a hinge, is padded well and attached. Upon the padded part rests the thigh or shoulder of the injured member. The wounded or broken leg or arm is bandaged between the two sides of the U. The bottom of the U is dented in order that a bandage may be attached to the bottom of the splint and the injured member for the purpose of pulling or applying the necessary weight to force the broken bones or torn muscles into place. It also serves to attach the splint to the foot of a bed or the front of an ambulance so that the wounded leg or arm may be elevated to any position which will give the greatest comfort to the sufferer.

There were numerous variations of this basic splint. Some have a hinge in the center of both sides of the U, so that the injured leg or arm may be bent at the knee or elbow and bound into position. Some have a hand rest at the end, by which the hand may be bandaged into an immovable position, so that injured muscles will not be moved by an unconscious effort. Then there is the U splint with an unmovable padded steel circle at the top, which fits close to the leg or shoulder erotch. A splint of this type is also made with hinges so that the arm or leg, stretched straight and fast, may be moved at the thigh or shoulder. There were small wire splints for the foot, the hand, and the wrist.

All splints were made by hand in a Red Cross factory equipped especially for the job and this was only one of the many activities from which the American Red Cross relieved the Army.

W. D. H.

## Correspondence.

### A PLEA FOR SCOUTMASTERS.

Mr. Editor:—

The following letter from Mr. Guy Waring explains itself. Doubtless there are many physicians who have men under their care who would make good scoutmasters and at the same time would be benefited by the occupation.

WALTER L. BURRAGE

Dear Sir:—

Boston, Sept. 19, 1919.

The Boy Scouts of America are sorely in need of more scoutleaders for troops for Boston proper, Charlestown, and East Boston, and desire your aid in recruiting them.

It is taken for granted that the Boy Scout Movement needs no explanation to you and that you admire the work so far done. The membership must be increased tenfold before all the boys entitled to the benefits of Scouting can be enrolled. In order to make any further progress there must be more scoutleaders and they are not easy to obtain.

To facilitate this recruiting a School for Scoutleaders will be opened at the Lincoln House, 80 Emerald Street, Boston. The instruction, which is most interesting, will be given from 8 to 9.30 P.M. every Tuesday and Thursday evening from October 21 to November 20, inclusive. No expenses are attached to the course of instruction. It is hoped that you will give your most earnest attention to this matter. Good scoutmasters are almost the whole foundation of the success of Scouting and it is plain that no greater work can be done for our country than to lead up the many unguided boys of the nation through the Boy Scout plan of training. It means making good citizens even out of the foreign born.

Think hard about this, and do not let yourself forget it until you have obtained recruits.

Applicants for the school will communicate with Mr. Edward S. Roche, Scout Executive, Room 1101, 453 Washington Street, Boston.

Respectfully yours, GUY WARING,  
Scoutmasters Recruiting Committee.

### NOTICES.

NORFOLK SOUTH DISTRICT MEDICAL SOCIETY.—A meeting for medical improvement will be held at the United States Hotel, Boston, Thursday, Oct. 2, 1919, at 11.30 A.M. The reader will be L. R. G. Craudon, Lieut.-Commander, U.S.N.R., on the subject: Report of a Reservist in the U. S. Navy (for Dr. K. H. Granger, South Weymouth).

DR. C. A. SULLIVAN, Secretary,  
South Braintree.

MIDDLESEX SOUTH DISTRICT MEDICAL SOCIETY.—The semi-annual meeting will be held at the Massachusetts School for the Feeble Minded at Waverley, on Wednesday, October 8, 1919, at 12 o'clock, noon.

Business: Report of the Committee on the Disposal of the War Relief Fund.

Lunch will be served at 1 P.M.

After lunch, Dr. Fernald will give a clinical talk and demonstration of cases and the methods of training the children. Opportunity will be given to inspect the institution.

Members intending to be present will kindly notify Dr. Walter E. Fernald, Waverley, Mass., by postal.

LYMAN S. HARGOOD, Secretary.

### RECENT DEATHS.

DR. GEORGE EDWARD RICHARDS died at Boston, September 8, aged 73 years. He was a native of Boston, a graduate of Harvard College (1867) and of the Harvard Medical School (1883). At one time he was district physician to the Boston Dispensary. He joined the Massachusetts Medical Society in 1883 and was retired in 1911.



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## Original Articles.

### CARDIO-VASCULAR-RENAL REGULATION

#### REMARKS ON CERTAIN PRACTICAL DEVICES OR PROCESSES USEFUL FOR THE CONSERVATION AND RECONSTRUCTION OF CARDIOPATHIC PATIENTS.

By J. MADISON TAYLOR, A.B., M.D., PHILADELPHIA, PA.,  
Professor of Physical Therapeutics and Dietetics,  
Medical Department, Temple University.

No greater welfare service could be rendered to human-kind than to popularize the leading facts about prevention, relief, and rational cure of diseases of the heart and its associated structures, and especially by their effects. Attention can be directed here only to a few of the more graphic points and resources, leaving to better men the task of carrying on. It is of prime importance for the public and the profession to realize how much radical help can be afforded in both prevention and restoration by means other than drugs, by agencies applied to the exterior as well as by wisely regulated conduct—all of which can be done in full harmony with one's ordinary scheme of life, and is likewise entirely agreeable. To master this one department of physical welfare will go far toward making the largest contribution of life, liberty, and the confident pursuit of happiness.

The maintenance of health and often of life rests squarely on the integrity of this one group of organs, heart, blood vessels, and kidneys, with their immediate correlates, the digestive, metabolic and respiratory group. They can be kept in order by the simplest and sanest of precautions and self regulations. When death does occur, no matter what be the outstanding malady, it is due to giving way of weak spots in the cardio-vascular cycle. Hence, while conservative measures and rational procedures are usually sufficient, proper medicines may be, and often are, required but only when early and essential precautions have been omitted. Their use at any time becomes a mere step gap.

The fact is that diseases of the heart and vessels have been shown statistically to be steadily on the increase in the United States,\* while this proportion is lessening in the older communities. We assuredly need arousing to the urgency of greater precautions. We are facing here the crux of human economies.

Most intelligent people, as well as many physicians, still regard the blood pump and its distributing channels as capable of taking care of themselves, as needing no direction until something serious happens to impair their integrity. This may be a partial truth, but much

\* The mortality statistics for 1917 (Census Bureau) state: In registration area of Continental U. S., rate per 100,000: Heart diseases (130), 153; Bright's disease and nephritis (40h), 197; arterial diseases (40h), 79.

more is needed, and can be readily impressed upon the patient by any competent clinician.

Just so soon as mankind, including some older members of the profession, come to visualize the circulatory cycle in full perspective, mortality statistics can be reduced materially. The poet creates a gloomy view who states that "our hearts like muffled drums are beating, funeral marches to the grave."

Mankind is so constituted as rather to welcome destruction than to undergo the exertion of substituting a rational for a symbolic or rankly optimistic or a *laissez aller* view. Many prefer to "acquire merit" by disregarding perils and thus fulfill the law of Mother Eddy and "leap before they look," as Richard C. Cabot says.

Fortunately some sense of caution comes at or near the halfway house of life, when perils to circulation most commonly arise. At that epoch there is demanded the pursuit of *vigilant personal hygiene*. When actual danger signals are inferred or estimated, there is no warranty for despair. All that is needed is a more rational revision of behavior, the formation of conservative habits whereby confidence shall be established, also mutual compacts and their observances.

#### USEFUL AGENCIES FOR INFLUENCING BLOOD AND LYMPH PROPULSION, HENCE CARDIO-VASCULAR STABILIZATION.

The worst leaks in survival values occur through damage to the blood vascular system. Any or all agencies capable of checking or stopping these leaks should be faithfully tried out, scrutinized, verified, and applied promptly and consistently. Openminded attention to promising remedies is an index of common sense. The final test is experience.

The resources of medication, large as they are, must have limitations. These limitations in grave exigencies impress us with a despairing sense of inadequacy. Moreover, instances are met of vast harm wrought by lack of wisdom in the manner of their use. This harm is occasionally fatal. Fatalities from medication are, however, not confined to misuse, but to fatuous confidence in them which fails to be justified.

Never did this scientific groping so impress me as during the recent epidemic of influenza. I was guilty myself. The guilt of others, how-

ever, struck me often with even greater force. Perhaps the fatal cases were hopeless when met. Perhaps we groped in a slough of ignorance. A larger proportion died than was justified. Not one swallow, nor one thousand swallows, makes a summer, but when a clinician succeeds by luck in having a far lower mortality than his colleagues, he is to be pardoned for inferring his methods had merit.

In justifying confidence in the measures here advocated, let me cite in evidence the fact that while I used much the same heart medicines, though in colossal doses, as the best colleagues, my own taste was for relying on every rational, (physical or bio-kinetic) instrumentality which promised to fortify the individual, as well as do the utmost to combat the disease by drugs.

Whereas sharing equally with most of these colleagues grave doubts as to the efficacy of some standard drugs in fullest dosage, also graver doubts as to the by-effects of those drugs, I am absolutely certain that the remedial procedures, reconstructive or bio-kinetic measures employed, did no harm if they perchance did no good. So much for squaring the account with my conscience.

I postulate that: in striving to accomplish equilibration of the regulative energies in the cardio-vascular cycle, vastly greater safety resides in agencies exerted from outside, by attempts at influencing reflex response, vaso-constriction, also eliciting vagogenic and sympathetic helpfulness, readily applied and released, than by introducing drugs into the economy which may keep on doing what they should not do, or fail to do what faith in the power of the unseen hopes they will do but don't.

I postulate further that: in the face of failures of drugs admitted candidly by such men as Victor H. Vaughan and a host of other authorities who relied largely on medication, or serum therapy, it is our duty to turn our attention to regulation applied upon the organism from without.

Matters of common procedure, notably those implicated in legend, in symbolism, in ancient authority, in the common experience of domestic gropings, in short, home remedies, good nursing and the like, however fortified by experience but not by scientific studies, are proverbially those which least attract research workers. About them cluster, therefore, the widest divergencies of opinion as to principles of action, inducing cloudiness as to their force, fullness, or

efficacy, hence a disproportion of confidence fading off into preferential beliefs.

Those facts of which every one is cognizant remain in a state of perpetual flux, with currents setting from anywhere to nowhere.

I further postulate that when these humble, seemingly simple and inadequate doings, efforts at stabilization, though bio-kinetic instrumentalities, shall be scrutinized with the same thoroughness and scientific zeal as are the givings of the pharmacodynamists, we shall succeed better and our patients survive longer.

Cardio-vascular-renal propositions are *at fond* significant instances of bio-hydraulic equilibration. Until we get this concept firmly planted in the student's mind he is in danger of cherishing disproportionate confidence in the so-called "physiologic action" of drugs to the exclusion of the equally significant physiogenic factors in the problem based on bio-physics, not only cardio-vascular-renal disorders *per se*, but the nutrition of those structures and also of the nutrition, metabolism, of correlated structures, and of the organism as a totality contributory to reflex stabilization.

One factor impressing me as deeply significant is the function of the vaso-vasorum. Deteriorations of, or beginnings of degeneration in, the arterial walls must depend, in great measure, upon functional competence in these nutrient vessels of the vessels. An important item in nutrition of the arterial trunks is normality of the elasticity, pliancy, and adequate functioning of the muscle masses, described by some physiologists as "the great oxygenating laboratories." Action, reaction, and interaction of the neuromuscular mechanisms conditions the integrity of the circulatory fluids, of the cells, and hence of all the finer processes of metabolism. Whatever helps action of the nutrient vessels of the vessels, makes for the nutrition of the vessels of these arteries.

Hence the first desideratum (in subacute or chronic disabilities or disorders or their effects) is completeness, or adequacy of muscular action, active or passive. Upon the adequate functioning of the muscles depends those needed compressions and relaxations of the arteries whereby suction and expression is exerted upon the vaso-vasorum. How otherwise can these minute and yet highly important organs escape deterioration?

The effects desired are thus enhanced, or at least ample distribution of nutrient fluids and

their return is secured: also adequate flow maintained through the organs of elimination. Where there occur stagnations, congestions, waterlogging in localized areas, something more is often needed than can be achieved by amplifying interaction by means of medicaments, even preparations of those most influential principles, the blood glandular or hemadenogenic organs.\*

Among the regulative agencies exerted from without, and helpful in restoring hydrostatic equilibrium, are coarser movements, muscular actions, and the finer aggregations of applied motion, passive or made upon the subject, in their diversified manifestations (bio-kinetics), and among the means available are these:

*Pressure*, compression and relaxation, the natural full action of muscle masses upon tubular and spherical organs and structures; also the respiratory mechanisms, the lungs through their moveable structures, diaphragm, and external muscles and the like. Also consciously performed, regulated breathing acts thus often prove of definite efficacy.

Likewise the *artificial* and *extraneous* compressions and relaxation (manual, manipulative, and other) whereby pumping action, current flow, is expedited by acts done upon the parts.

Also particularized pressures, compressions, concussions, and other agencies for eliciting fuller *reflex action* and *reaction*, such as can conveniently and compellingly influence the spinal vasomotor, vagogenic reflex arcs, etc., exerted upon areas adjoining nerve centers, subcenters, paravertebral structures, at or near points of exit, of *rami communicantes*, also nerves in continuity. This subject has been elaborated carefully by Albert Abrams.

These reflex effects, reflexo-genic influences, are capable of being exerted satisfactorily by the simplest of agencies, the hand, the finger tips alone, or one reinforcing the other, by suction, by impacts, by concussion, by a mallet upon a mass of firm rubber (like an eraser) exerting powerful and controllable push and pull phenomena; also by posture, attitude, gravity, by belts, corsets, rubber tissue, Z. O. plaster straps; likewise by thermogenic agencies, heat and cold, local or general, muscular movement to the point of "warming up," and by rest, by skin friction, subdermal traction exerted at the point of induced hyperemia, by encircling bands, etc.;

\* For a masterly presentation of "The Effects of Exercise on the Blood," see P. B. Hawk, *Am. Jour. Physiology*, Vol. x, p. 241; also Schröder and Haven, *ibid.*, Vol. x, p. 229, 1915.

also by colon irrigations, by venesection, by centrifugation of fingers (whirling the arms).

Among reliable thermogenic devices are remedial baths, hydrotherapy, packs, hot and cold compresses, Turkish baths (dry heat), Russian baths (steam heat), the superheated dry air devices of Tyrnauer, up to 300° F, electric light cabinets, violet ray, Alpine sun lamps (the Negelschmidt or Kromyer quartz lamps).

Cold deserves much attention, especially cold and wet compresses. Dry cold is capable of checking abscess formation and is a means of retarding pus and various disorders of stagnation or local injury.

An efficient and reliable field of relief and cure not yet systematized is that of pressures exerted on the paravertebral tissues by finger tips whereby vasomotor and visceromotor effects are induced (through vaso-constriction chiefly). Various movements elicit gravity and muscular and hydraulic compression, *i.e.*, attitude (or postures) to induce changes in interrelationships of viscera and blood vessels, as Trendelenburg and Fowler positions, knee-chest posture, head hanging to check hemorrhage or to empty bronchi, and centrifugation by whirling the arms to induce hyperemia in fingers by driving blood to finger tips. Certain attitudes and special movements induce compressing action between internal and external muscles, *e.g.*, psoas and abdominal parietes in enteroptosis, stagnation, prostatism, etc.

Regulated or educational exercises, passive, active, and free, accomplish good results by activating the pumping action of the heart and muscle masses. Belts are also useful here to constrict splanchnic bloodvessels, to induce counter-pressure, hence blood distribution; also to arrest hemorrhage, *e.g.*, Mombert's, Longstreth's, Kilmer's, Dawbarn's, Achilles Rose's, etc.; also the familiar tourniquet, or rubber bandage, or encircling tube, (*e.g.*, constriction of the neck in seasickness by an elastic band with hooks and eyes around the neck). Rhythmic compression of the heart in apparently moribund states is an important mechanical life-saving agency. Another device is resting the veins by raising the legs higher than the hips.

In cases of high fever, of cerebral excitement, when fear, or antagonism to cold water exists, use a sprinkler with tepid water on the back, the patient lying face down. Begin with warm water, 85° to 100° F., and gradually cool to 75° to 70°. This will rouse from stupor or allay de-

lirium, is also of great value in distresses accompanying many chronic states, high blood pressure, arthritides, gouty exacerbations, stagnations and other disturbances of metabolic equilibrium. Alternate hot and cold douches with greater force of impact from a hose or tube in a warm bathroom are useful to stimulate sluggish local circulation. Colon irrigation is a hydrotherapeutic and vascular regulative of great use to unload the bowels of putrefactive matter and toxic mucus. And also as an emphatic diuretic (see Martin H. Fisher's "Alkaline Irrigation for Nephritis," etc.). The temperature should be below that of the body, about 90° to 80°, to induce evacuations; to soothe spasm it should be hot, 105° to 120°; to induce diuresis any temperature will do, the best being cool, 80° to 75°. All are useful in fevers, acute internal diseases, cardiovascular renal diseases, arthritis deformans, acne vulgaris, pruritus ani, eczema of the rectal surfaces, etc.

Superheated air is of wide applicability (*vide* Tyrnauer), though less used than it should be. This is true also of induced or reflected heat from electric lights, white and blue; also "leucodescent lamps." Less well known are the effects of centrifugation, or whirling the arms to drive blood forcefully to the finger tips and joints of hand and wrist. This is my own device, and it is found most useful to enhance sluggish circulation in the extremities; to enhance phagocytosis in gouty joints, in local inflammations, septic and other; to relieve interphalangeal rigidities and to aid in cure of angiotropho-neuroses, "wax finger." Raynaud's disease, effects of trench foot. Skin friction compels surface distribution of blood.

Venesection is particularly useful in uremia, coma, and vascular over-tension, and when the blood is vitiated and viscous as in cerebral hemorrhage. Local freezing (Albert Abrams) over spinal centers forcefully affects disorders of the spinal centers shown at periphery. In neuritis of the arms, spasm, pain from fibromyositis, and in herpes zoster, freeze over the fourth and fifth thoracic vertebrae. Concussion on certain points, as the seventh cervical or other vertebrae, enhancing or depressing vagus tone is most valuable in a variety of conditions of loss of vagotonicity, notably in aneurysm of arch of the aorta, angina pectoris, exophthalmic goitre, etc. (See Abrams' book, "Spondylotherapy".)

Let me cite an impressive experience. A vig-

orous gentleman of 75 years came to my office about twenty years ago, who manufactured and sold a "kidney belt." He told me he had cured himself of chronic Bright's disease, citing his physicians and history. He accepted only clients who could prove they were real renal victims. The price was \$300.00, but unless the owner obligated himself to carry out the instructions, he was penalized by "having the belt taken away."

These instructions consisted of excellent minute supplemental measures (bio-kinetic), among which were vigorous dry skin friction, on rising and retiring, not less than half an hour at a time, to be followed by innunctions of olive oil. He also sold them the brush and the oil. Likewise he insisted upon a particularized dietary, and certain exercises, chiefly to achieve pliancy, uniformity, and completeness of all normal movements.

Several of his patients came to me for varied reasons. They were mostly middle aged or elderly nephropathics. The condition of their skin was really remarkable for tone, color, elasticity, and temperature. Let me urge that such sound and effective instructions be imitated.

The chief reasons for or explanation of induced reactions on circulation are somewhat thus:

Every mechanical stimulus awakens reactions on the circulatory mechanisms. In health, or in one not extensively disturbed or deranged, reactions to stimuli are promptly followed by equilibrium and no harm is done. When the organism as a whole is thrown out of gear, one or more of the local regulative nervous mechanisms fail to do their full duty.

It is a matter of common knowledge that it is entirely possible to stimulate the periphery so as to aid in regulating the disturbed circulatory mechanisms—e.g., the effects of a mustard plaster (*vide* Sir Lauder Brunton "Pharmacology"). Also the familiar effects of heat, of cold, of rest, of impacts, etc. It is equally well established, but not so commonly realized and only rarely employed, that when the right sort of stimulus is applied to or near subcenters, as over the plexuses, the nerves in continuity, effects can be produced, actions enhanced, in accord with function and in directions desired.

"An Important Factor in Circulation," the title of an article by the late Achilles Roca (April 20, 1911, New York Academy of Medicine) consists of the mechanical forces of the

body which distribute blood and other fluids; (a) as blood and lymph in vessels; (b) as tissue juices, and (c) in constituting the most important part of the cells. A common feature is that they may be mechanically dilated or compressed and that they are also dilated and compressed of their own force. The task of moving water devolves upon the heart, hence the need to meet this by adjusting the resistance. In order to equalize gravity the *nerri irrigantes* come into play. They dilate the veins, creating vascular dilatation and thus induce a vacuum, hence cause suction. The heart thus acts as a suction pump through hydraulic action through the veins. He emphasizes the fact that relaxed tissues absorb fluid more readily, hence the efficacy of abdominal support by belts, and the like.

#### SUMMARY

The objective considered in repairing cardiovascular-renal disorder and so much of the structures involved as are remediable, is to restore equilibrium in regulative forces acting within through application of suitable agencies from without.

The possibilities are of the best provided the enterprise is begun early enough. This, however, being seldom practicable, the probabilities are vastly better at any period than is generally appreciated. Hence the value of visualizing them, of surveying our resources frequently, of making use of those applicable in the instance, and of faithfully appraising our experience.

No one has a right to condemn, deprecate, or deny efficacy to reputable measures until he has honestly and adequately subjected them to fair trial under fair conditions. In the immediate future much revision of bio-kinetic therapeutic measures must come about, and to the vast advantage of medical potential. The process under consideration includes the education of the creature to adapt itself not only to the ordinary exigencies of environment, to varied stimuli or irritations, but especially to recover poise after encountering extraordinary exigencies, new, strange, even adverse situations.

The mechanisms notably involved are the reflexes, the spinal, sympathetic, vegetative, autonomic in all their complex implications and means whereby they can be utilized in the process of readjustment and stabilization. Also the great regulators of these, the ductless or blood (hemadogenic or endocrine) glands which, as Sajous has so clearly and convincingly demon-

strated, play the major rôle in stabilization, in particular of the blood, bloodvessels, lymph channels and their contents.

The elemental forces acting from within, which are thus subject to influences exerted from without, are, first of all, motion and heat. Thermodynamics and motor-dynamics in the form of bio-kinetics. Of these bio-kinetic means or agencies we have presented memoranda of some of the more usable or applicable forms.

We may then pass in review a crude schema of manifestations of cellular energies thus:

1. *Psychodynamics*, the "power of thought," the "primal urge," élan vital, or as the Freudians delight to call the whole push, "libido," phases of which may be categorized as the affective functions, behavior, feelings, emotions, promptings, trends, tropisms and the like phases, all of which must be reckoned with as factors in cardio-vascular equilibration. Fear, anxiety, worry, doubt, self-pity, form the crux of most diseases of mind and also of body as Boris Sidis has convincingly shown in his book, "Causation and Treatment of Psychopathic Maladies," 1916.

Every clinician is, at least, aware of the subtlety and surprisingness of emotionalism as a factor in disorder or repair. Moreover, unless he learns to inculcate and guide the factors of conscious control, either the case remains *in statu quo ante* or passes from bad to worse, and by reason of this factor alone no matter what cunning combination of drugs is invoked.

2. *Physico-dynamics* or Bio-Kinetics, the potentialities which reside in, and are manifested by physics, from ponderability, gravity, hydraulics, pneumatics, thermogenics, photogenics, electrogenics, all the way to the simplest adaptations. Here we have the familiar but too often unclearly comprehended domain of heat and cold, actuation and inhibition, the "changing play of light and shade," of color, odor, taste, or attraction, repulsion, and the innumerable stimuli or stresses or overbalancing instrumentalities of environment.

Within this gambit are many bio-kinetic resources, some admirably elaborated and some as yet only inferred or hoped for, but which will evolve. Under photodynamics we need merely mention a few peculiarities chiefly among direct sunlight (heliotherapy), electrodynamics, especially the violet rays, which are equivalent to filtered or modified sun rays.

Under ponderodynamics we may include all

such forces as have to do causally with weight, either as a cause for harm, *e.g.*, drag, strain, direct and indirect, also torsion of arterial trunks or of limbs, etc. Also traction, suspension or the converse support, release of pull, traction or torsion or relief from compression of weight, *e.g.*, fluids in over-relaxed intestines or compressions exerted for a physiologic purpose, *e.g.*, Biers' method of compression of arterial trunks; also suction hyperemia; also support, by apparatus, belts, cuirasses, to raise the abdominal contents, to aid splanchnic circulation, and to hold them in favorable conditions for functioning; also posture (or rather attitude) carefully adjusted, *e.g.*, Trendelenberg, head hanging, "resting the veins" of the legs by raising the feet an inch or two or a foot or two, higher than the buttocks, etc. Dr. Morris Longstreth devised and used with immense success a belt I have described and used for 25 years.

Motorodynamics, motion, movement in its varied manifestations, (bio-kinetics), in its positive or negative phases, or actuation versus inhibition, stabilization through alternations of push and pull, movement and rest.

Active movements, myogenic equilibration, muscle training, particularized modifications of, training of structures so as to assume more advantageous attitude or posture, *e.g.*, of the back, neck, abdominal muscles, thoracic muscles, diaphragm. Active elasticizing and full stretchings, training of normal movements to reach (extend) or withdraw (flex) or turn (torsion) in all directions in accord with design or function.

Passive movements (negative motor phases) exerted upon a part from without, by instrument or by an operation, by bending, straightening, forced flexions or extensions or torsions, pulling or pushing, exerting compression, also:

Resisted movements, part passive and part active, by alternations of extension-flexion and of flexion-extension, by graduated tension and relaxation, finally the whole extensive and elaborate subject of:

Massage—manipulation—manotherapy. From mere hand squeezings and relaxation, to artistic moulding, separation, pressure, thrusts single and double, *e.g.*, in a direct line or exerting modified fulcrum action as of a part supported using force at two opposite points, the leverage action of a long bone in its socket or on intra-articular pressure to release tonic spasm adhesions, rigidities, stiffness, to secure elasticity and

thereby place minor blood and lymph vessels in favorable positions for ebb and flow of fluids.

Elicitation of the reflexes, activating reflex responses, especially such as induce effects on vasomotor balance or imbalance, a very efficient means of expediting arterial contraction and relaxation, hence nutrition and elimination, general or local.

Also making use of the spinal reflexes, the sympathetic, vegetative or autonomic, the major effects obtainable or those wherein mechanical stimulation of areas influence nerve centers and sub-centers bearing on vasomotor, or vagotomy or sympathectomy: also indirectly on the nutrition of cell bodies at the interdiscal cord levels.\*

#### PARTICULARIZED PERSONAL HYGIENE.

Among the more familiar or particularly applicable items are: Diet, mastication, selection, association of foods; likewise elimination, economic attitudes in defecation, skin care, dry friction to whole dermal surface tenderly, subdermal traction, etc.; clothing, etc.; judicious activities and rest, etc.

#### A SELDOM RECOGNIZED CAUSE OF HIGH BLOOD PRESSURE.

Edgar F. Cyriax, of London (*Practitioner*, Nov., 1917), says that among the various conditions which have been accepted as causes of high blood pressure we search in vain for mention of one which is very common, namely, irritative states of the erector spinae. (In this communication the term erector spinae will be taken as including the dorsal extensors from sacrum to occiput.)

Of these irritative states, there are three chief groups:

- a. Hypertonus.
- b. Diffuse fibrosis or fibrositis.
- c. Venous congestion.

All of which may exist with various degrees of intensity, either locally or generally, alone or in combination.

The diagnosis of these conditions is not difficult when they are looked for and especially when palpated for:

a. Cervical hypertonus, if at all pronounced, is quite obvious since it produces the short thick neck which for centuries has been associated with apoplectic tendencies. Pathological increase in the normal curve forwards in the lower

cervical region is often met with, and is doubtless the result of the persistent muscular contraction. Hypertonus in the dorsal and lumbar regions is not so obvious. With the patient lying on his face, there should, normally, be no difficulty in relaxing the extensor muscles of the back, but in hypertonus this is often impossible or very difficult. If the patient is able to effect this relaxation, the slightest stimulus, such as a mere touch, will immediately induce a continued powerful contraction of the muscles mentioned.

Changes in the normal curves of the back may be found, a common example is lumbar lordosis.

b. Diffuse fibrosis or fibrositis is a frequent cause of so-called "rigid back," a condition whose importance has been greatly underestimated, for it is a potent cause, either primary or secondary, of disease. Its chief characteristics are limitation of movement, pain on attempting to move, and diffuse tenderness in the erector spinae. Also the well known nodular thickenings of the neck which are the cause of "muscular headache." These thickenings are readily defined by ordinary deep palpation.

c. Venous congestion, although usually only an accompaniment of (a) and (b), may exist alone, and is often associated with a slight degree of edema. The commonest site for local edema is around the seventh cervical and first dorsal vertebrae, where a circumscribed swollen area may be found, boggy to the touch and not infrequently showing radiating lines of small congested blood vessels.

The methods by which these irritative states induce elevation of the blood pressure is not difficult to trace. It is by means of a continued series of sensory stimuli to the posterior spinal nerves, in other words, by a never ending series of pressor effects. If Nature is unable to compensate for these as they arise, an increase in the blood pressure is the result.

As regards the actual exciting cause of the irritative states of the erector spinae, there is one important group, which up to the present seems to have escaped recognition, *i.e.*, anomalies of the vertebrae either as regards articulation or position. Synovitis of the vertebral joints, especially the cervical, is much commoner than generally supposed, and so, too, are apparent malpositions of the bones, which in their turn necessarily involve similar anomalies as regards their cartilages; slight multiple adhesions are frequent. The reason why these vertebral adhesions and synovitis are so common in the neck is, to

\* See Sir Lauder Brunton's explanation of the effects of a mustard plaster, *Text Book on Therapeutics*, also laboratory findings of John P. Arnold. Also addendum to this paper, *Memoranda*, Mr. Edgar F. Cyriax, *Practitioner*, November, 1917.

a large extent, due to the fact that one is so seldom called upon to exercise the cervical muscles against resistance. The pathology of joint trouble from insufficient use holds good for the spinal column just as for articulations elsewhere.

From the practical point of view, the identification of the above-mentioned causes of high blood pressure is of considerable importance. All treatment must be directed towards removal of the cause of disease, especially that described as "mobilization of the spinal column." By this is meant active and passive movements of the vertebral joints, passive manipulations (vibrations, petrissage, etc.) of the erector spinae, a suitable selection being made in each case.

Cyriax holds that if the cause of the elevation is partly or wholly to be found in irritative states of the erector spinae, no mechano-therapeutic program is complete without appropriate trunk and neck movements.

## CANCER OF THE MOUTH.\*

BY FREDERICK BRYANT, M.D., WORCESTER, MASS.

It is the purpose of this paper to discuss the significance and importance of mouth disease with special reference to the etiology and treatment of oral malignancy. We hope to be able to tabulate facts which will prove helpful to both family physician and dentist alike and to urge their more hearty coöperation, to the end that whenever causes of disease exist in the mouth, they may be more promptly detected and removed, and that an earlier discovery and more immediate action in the case of buccal malignancy may result.

We regret to relate that only within the past few years has the medical profession given adequate consideration to the mouth as the vital drawbridge by which hostile infections gain entrance to the human citadel. When this new idea or discovery was announced and had gained medical publicity the pendulum of professional opinion swung much too far. The tonsils and the teeth, like the proverbial liver of the days of our fathers, were blamed for almost everything that happened to the race. When it was well established that these were both blameless in cases where they had been suspected, that

many cases of rheumatism could not be traced to the teeth and that only a few cases of heart disease could be accounted for by the tonsils, a reaction set in and the pendulum has started to swing back. It is our purpose to attempt to conserve as far as possible that which the recent past has taught, that the reactive pendulum may not swing too far in the other direction, and we become prejudiced and shut our eyes to mouth conditions because we often find them unproductive of disease.

The records of the examinations of our draft boards reveal the startling fact of the dental neglect of our young national manhood. Many thousands of otherwise robust men were disqualified because their teeth had become so extensively extracted or diseased that not enough strong sound teeth were left to maintain the rigors of military life. The absence of grinding teeth was appalling. A complete and perfect set of teeth, in an American boy, was the exception. The loss of service, from dental disease, was a tremendous factor in actual war experience. This, then, becomes a large consideration in the preparedness of our people, not only for the strenuous exigencies of war but for that longer, greater, and more important warfare with that archenemy of our race, disease—which, from the cradle to the grave, seeks ever to destroy us.

The family physician and dentist must be held responsible for these things for every patient who comes under their respective care. The family physician should always take the patient's teeth into full and deliberate consideration and when there exists the least vamping of a suspicion of their integrity or if the patient is suffering from a disease which could in any way originate in teeth difficulties, he should communicate this information to the family dentist, who should give the case an unbiased and thorough investigation. The roentgen ray enables the dentist to obtain accurate and complete information of the condition of the teeth and jaws, and no dental examination is complete without its employment. The outlay is trivial compared with the value of the knowledge obtained, whether it be positive or negative. It is far better that many roentgen examinations should prove negative than to let one serious but easily remedial case go undetected.

The family dentist should be constantly on the lookout for mouth conditions which may be act-

\* Read before the Worcester Dental Society, Sept. 29, 1919.



ing as a present or future cause for general disease. Here the responsibility is pretty evenly divided and unless we coöperate in a mutually helpful way, a serious responsibility may be shifted so that between two stools the patient may fall to the ground and grave pathological conditions allowed to develop and grow till no form of medicament can avail, and the hope which might have been reasonably assured is gone forever.

It is not the purpose of the writer to enter deeply into a discussion of oral sepsis, not but what it is a subject of first importance, but because this is primarily a paper on mouth malignancy. In this connection, however, we must digress sufficiently to emphasize the fact that in our own experience and that of our associates a great variety of diseases, acute and chronic, immediate and remote, have had their origin in the mouth. I shall note but one example: A patient suffers from a disfiguring goitre. She is referred to a dentist who finds suppurative processes in the lower teeth. The dental remedy was applied and she promptly returned to her normal appearance. And so we might cite a long list, even including the eyes, of extraordinary and wonderful cures accomplished by the removal of dental causes.

In relative frequency, as a favorable haunt of malignant disease, the mouth ranks fourth, being surpassed by the female breast, uterus, and the gastro-intestinal tract. In men the mouth is six times more susceptible.

Why should cancer be so frequently found in the mouth and what elements or influences here tend especially to its causation? The exact cause of this baneful disease is not known, but authorities have pretty much accepted the theory that chronic irritation in some form, whether it be perceptible or not, plays an important rôle. A normal body cell when long under the influence of some irritating agent, whether it be chemical or traumatic, seems to undergo an inherent change in its nature and reverts to an embryonic type and a rapid proliferation or procreation of the evil cells follows. Mouth malignancy admirably substantiates this theory, for the mouth has not only been considered the dirtiest and most germ-laden part of the human anatomy, but it abounds in exceptional sources of chronic irritation.

Taken as a whole, people woefully neglect their teeth. This is especially true of men, hence their increased susceptibility to mouth cancer. Tradition

has it that the faithful Boswell once related that his hero, Johnson, as a matter of unflinching routine, devoted fifteen minutes every morning to prayers and attention to the bowels, but it has not come down to us that he made any such appropriation of time for mouth requirements. This universal neglect of the teeth gives scope to irritative influences which in turn may develop into the dread malady. This etiological conception of mouth cancer reveals the startling responsibility which devolves upon the family dentist. It is clearly his duty to safeguard his patient against chronic irritative influences. The serious consequences of neglect must ever be present in his mind. Beware of mouth irritations should ever be his motto. This conception not only opens up a great responsibility but it also indicates the possibility of achievement. Viewed in this light, the dentist becomes the master-man in the great struggle to combat oral malignancy. If the writer can substantiate the dentist's responsible opportunity in mouth cancer, he will feel amply repaid for this undertaking. This, then, is the burden of this discussion. And here let us be specific and definite. Unquestionably the conscientious dentist has had the valuable prophylactic measures, about to be discussed, constantly in his mind, and has promptly seen to their correction or removal as a part of his excellent art, but it is very probable that he has never had his attention called to them as cancer preventative measures. He should see to it that no sharp or jagged tooth comes in contact with the tongue or cheek. If such a condition exists, it can readily be seen how the habit of chewing gum or tobacco would facilitate the irritation. Carious teeth should be filled or extracted. An old snag or root should not be allowed prolonged habitat in the jaw, whether suppurating or not. The writer is positive that this is a large etiological factor. Ill-fitting or broken dental plates have been charged with malignant possibilities by our radiotherapists.<sup>6</sup> Old people, of humble circumstances or penurious habits, have been known to harbor an old broken or irritating plate for years. Some of these seem never to have been cleansed. In many of these neglected plates some of the teeth are missing, leaving sharp metallic edges and points that irritate the tongue, gums, and cheeks, like a veritable thorn in the flesh. Crowns which are loose or ill-fitting, or which present irregular edges which infringe upon the gingivæ, should receive prompt atten-

tion. "The plates for supporting false teeth, when imperfectly fitted, are proving such a prolific source of cancer that a warning should be sounded to the general public. The medical and dental professions will do well in coöperating to take prompt action whenever there are indications of chronic irritation of the gums from which teeth have been extracted. Ill-fitting sets of false teeth and bridge work have probably been responsible for many deaths from cancer."<sup>18</sup> Fields presents a classified series of 157 cases with a malignant process involving either the superior or inferior maxillary bone, 87 of which presented a clinical history that showed the initial lesion or ulceration or nodule to be in close proximity to an artificial denture of which the patient offered complaint. The washing away or the wearing out of the cement in post crowns offers an irritative influence. The old unsanitary bridges should be viewed with suspicion.

We are very positive in the belief that everybody should see a dentist once every six months, whether in dental difficulty or not. The dentist should keep a list of his patients and call them back periodically. He should keep his record with the same regularity that the insurance agent informs his patron of the approaching lapse of his policy. Business cares, the rush and whirl of our modern way of living, crowd out and unduly delay the needs of our bodies. We are confident that such a system of recall would not only work out a great economy, both physical and financial, for a stitch in time saves nine, but might, at times, prove a life-saving measure.

Since cancer of the mouth is six times more prevalent in men than in women, and since it is much more rarely found in those who abstain, we are compelled to take the use of tobacco into serious consideration. We believe this is incriminating evidence. Whether it is the heat from the tobacco or pipe-stem or an irritation from the smoke of a narco-chemical action, we are, as yet, unable accurately to determine. Therefore, we must place a blanket attachment on the use of tobacco in any manner. Students of cancer are agreed that tobacco is one of the causative factors, for used in any form or fashion, it tends to foul the mouth and reinforce, if not initiate, irritative agencies. Alcohol and very hot drinks are classed in the same suspicious category.

Pyorrhea is an irritating factor of first rank. All these and kindred conditions which may

have pre-cancerous possibilities are decidedly detrimental to the general health of the individual, so that the ill effect is not only local, but general.

Syphilis, which almost without exception manifests itself in the mouth, when untreated, and at times when well treated, is accused, with reason, of acting as a chronic irritative influence through the production of gummatous fibrous tissue. An eminent authority states, "Syphilis is one of the most common antecedent factors in the history of cancer of the mouth."<sup>17</sup>

Leukoplakia should also be mentioned in this connection, for it seems a pretty well established fact that it is a pre-cancerous condition. All expressions of a diseased mucous membrane of the mouth should be viewed with suspicion. Any open sore or ulceration of the lip or mouth, especially if it possesses an elevated edge, should at once be taken into full consideration, a diagnosis made, and treatment applied. Face the worst at once, remembering that the mouth is a favorite abode of malignancy, and that any lesion here, although small and slow of growth, may be nature's expression of alarm for an approaching danger. The patient is only too anxious to hear hopeful words, to have his apprehensions allayed, to dodge the fateful truth, to delay and put off the evil hour of anguish and fear. Neither physician or dentist should keep any month lesion "under observation." This is another expression which, while it may sound a little more wise and professional, yet is synonymous with procrastination, and procrastination here is the thief of life. "Tide and time wait for no man." We might, with good reason, add cancer to that impatient and restless list. It is blessed to discover cancer early, but it is more blessed to remove the cause. Viewed in this light, the dentist who realizes his opportunities becomes a transcendent factor in the great though one-sided battle with the deadliest scourge of our race, mouth malignancy. Students of malignancy stand as one in the value they ascribe to the early detection of cancer. What matter is it, then, if a few unnecessary treatments or consultations are held? What consequence if a suspicion goes unfounded? What harm if an incipient ulcer is suspected of malignancy? Better, far better, that this should happen a hundred times over than to sit unconcernedly by, disregarding nature's signals of distress until a local or regional disease has become a general catastrophe.

The history of the results of all forms of treatment of buccal malignancy constitutes the darkest page in the disconsolate and despairing record of cancer therapy. This pitiable record proves that oral is the most malignant form of new growth. Murphy's series of reported cases proves the limitations of skilled surgery. The report to which we refer was a tabulation of most favorable cases where there was no visible glandular involvement. The cases were taken early and at a time when the process was local or at least regional. These cases were submitted to radical skilled surgery and 52 per cent. died of the disease. Another report from the same worthy source, where there was some glandular metastasis, showed a mortality from cancer of 75 per cent.

That we get these cases late is evidenced by the fact that eminent physicians have died of the disease. But there are reasons why the mouth has become the treacherous cock-pit of malignant sieges. The richness of this locality in blood vessels, glands, and lymphatics and its nearness to vital structures makes its treatment or removal extremely difficult. Surgeons have long most dreaded and have given the gravest prognosis in this area of malignancy. While operations in this locality have been most difficult, disfiguring and distressing from interference with the respiratory and masticating apparatus, recurrences have been most common. Surgeons now hesitate to operate on cases of malignant mouth disease, for its return seems almost inevitable.

"Cancer of the tongue is now regarded by most surgeons as inoperable, at least the promise of a cure is almost worthless. Their rapid return after complete excision is so certain as to discourage all but the very young and very bold operator."<sup>3</sup> What Fields says here of the tongue might as well be said of the entire group of structures which make up the upper end of the alimentary canal. We have come to regard cancer anywhere here, for that matter, as prophetic of certain doom. It is only comparatively recently that the reports of radiative treatment have been encouraging. The report of The Radium Institute of London, June, 1915, contained these words: "Epithelioma of the buccal, lingual, and pharyngeal mucous membranes usually proves refractory and disappointing in its response to radium." However, we note this more hopeful conclusion: "Under new methods of application better results may be expected."

The same year we read this statement in the annual report of The Royal Infirmary: "While in advanced malignant cases a cure may not have been effected, yet in practically all treated more or less benefit was produced through the relief of pain, cessation of discharge, healing of ulcerative surfaces, the removal of local growths, and the prolongation of life." I quote the prophetic words of Delavan, written early in the year 1916: "The study of radium is in its infancy. Few investigators, at present, are ready to issue formal reports of their work, wisely refraining from announcing results until their deductions can be placed upon a stable basis of well proved fact. Any attempt to drag it before the medical public, at present, would be premature. What is needed is, not publicity, but rather the development of scientifically proved data upon which reliable reports of progress are possible. The securing of such data requires long continued and painstaking study of the action of radium, under conditions favorable for accurate observation in the hands of men especially qualified for the work. When these conditions have been fulfilled, and not till then, may we hope for the beginning of a literature at once valuable and instructive. Meanwhile, however, even the most conservative observers are willing to admit that encouraging progress is being made."<sup>4</sup> These conditions have been fulfilled far beyond Delavan's far-sighted vision and we now have a radium literature, voluminous, as well as valuable and instructive. A radium technic has been perfected so that the dosage is much more standardized. A wonderful transformation and evolution have taken place in the art of radiation. "With radium and the powerful transformer and the Coolidge tube, the therapist administers with precision the single massive dose that his experience tells him is necessary."<sup>5</sup> So definitely and accurately has the radio dosage been refined and developed that not only are burns no longer known, in experienced hands, but the amount of radiation to be delivered to the disease in question can be regulated to any degree of intensity desired.

We can now safely conclude that radium has come to stay. We have a Radium Society of America of four years' growth, officered and committed by medical men who have had long and brilliant experience in clinical, surgical, radiation, and pathological fields of study. Radiation has furnished the medical army with a new wing which, in time, of critical and well-

nigh disastrous assault, will be found available with an armamentarium of tremendous potentiality. Better and better results are being reported the world over. All the large clinics are employing it more and more and are rapidly increasing their supply. Its use is wisely restricted to a limited number of conditions and it is used much in combination with the roentgen ray and surgery.

New reports twenty-one cases of cancer of the jaw and cheek in which he used heat and radiation where there was no glandular involvement. Twelve of these suffered no return in six to eighteen months. He speaks of the results as encouraging, and concludes, "Much more is being accomplished than formerly."<sup>2</sup> He also reports three cases of lymphangioma of the tongue and concludes, "It would seem that radium is a specific for angioma and lymphangioma, and its great value is that it gives such remarkable results in these conditions which are not surgical."<sup>2</sup>

Fields concludes his admirable paper on "False Teeth as a Cause of Cancer" with these words: "Unfortunately, the majority of the cases coming to us are classified as inoperable. We find, however, that under radium therapy, about 8 per cent. of such cases are improved to the point where operative procedures may be favored. As a net result of the 87 cases here enumerated radium accords a clinical cure in about 18 per cent. By clinical cure I mean a complete retrogression of the mass and its failure to recur for periods running from 32 down to 6 months. Marked temporary improvement followed radiation in 65 per cent. of these patients. While this is not as promising as we could wish, we believe that no other form of treatment could have attained such results."

In the concluding pages we wish to discuss a combination form of treatment of mouth malignancy to which we make no claims of originality. When we take into consideration the gravity of this particular field of malignancy, its almost hopeless prognosis, the sad disappointment of all forms of mediæment, surgery included, we believe that in this specially disastrous locality a radio-combination method of treatment, while it is far from satisfactory, yet promises most for the present and immediate future. Surgery is of service only when it can be employed very early and extensively and followed promptly and at regular intervals by radiation. Radiation thus becomes the handmaid of surgery.

"Such a treatment we would class as ideal in every case when operation is possible."<sup>2</sup> All of our cases have been of this inoperable type, most of them having recurred following an extensive removal. The results have been most favorable where the lesion has been inoperable from its position rather than from its extent.<sup>1</sup>

The method of treatment to which we refer and which we believe gives the best results and the best promise for the future, is a combination of the cautery or electro-coagulation, radium, the roentgen ray, and surgery.<sup>2</sup> The operator will not always find it necessary or feasible to use all these agencies in the same case. In the different severities and localities of the lesions in the mouth, experience will dictate his choice. The most dependable of this group, in our experience, the one we always use in every case, and frequently alone, with great satisfaction, is the massively tremendous dosages of roentgen rays.

The bulk or as much as possible of the cancerous tissue should be removed locally so that the radiation may be in close contact to the base of the evil tissue. The actual cautery or electro-coagulation is preferable to surgery for this purpose, because there is no bleeding or unnecessary loss of tissue and the cancer cells are not let loose into the lymphatics or the circulation. All this outgrowth of cancerous tissue should be thoroughly but slowly destroyed. If a large sensitive area is involved, ether will be found necessary. If any teeth are in the way or are involved they should be removed. Small soldering irons make a convenient cautery. Whether cautery or electro-coagulation is used, "a slow heat that gradually cooks the tissue is preferable."<sup>2</sup> If the antrum is involved it receives the same treatment.

The slough resulting from this destruction of tissue clears away in from ten days to two weeks time. This leaves a red healthy base to which radium is directly applied. Radium acts from point contact only and must therefore be accurately applied directly to the area to be remedied. If the wonder metal impinges the healthy mucous membrane it inflicts a somewhat painful burn while the malignant area escapes untreated and therefore unaffected, and the patient has been done harm rather than good. To accurately accomplish this purpose we seek the aid of a dentist to fit a plate fashioned out of impression composition, which includes the area of disease. We then fix the radium tubes in this composi-

tion and change them from place to place by the use of an alcohol lamp and a small soldering iron. The radium dosage, as modified by the time and screening, will depend on the duration, extent, and obstinacy of the growth. Here individual judgment and experience must guide each operator. We believe in three close intensive treatments and then rest for three or four weeks. The radium from within and the roentgen ray from without enable us to cross fire thoroughly.

Externally we make use of the most massive roentgen ray cross-fire dosage that we can possibly produce. We spare neither tube nor machine in delivering the deepest penetration possible and after three years' experience have not one single untoward result to record. In no incidence has the skin been burned, or marked distressing symptoms followed. When a patient complains of nausea we desist for another appointment. Some few patients will require more treatments with less areas at a time. We average about three areas in the month cases, over the area involved and along the lines of metastasis. When the cancer involves the cheek or lower lip the metastasis into the submental and submaxillary glands is generally early. To cheek control and, at times, destroy these malignant and all-dangerous metastases and the sclerosing of the innocent glands and lymphatics further out is the work of the deep roentgen ray. We have come to regard this use of radiation as one of decided potentiality. The output is much more abundant than radium and is admirably suited to covering large areas.

If after this combination treatment has been fully employed, with adequate dosage and sufficient intervals, any local remnant of the cancer persists which the radiative treatment fails to destroy, and here we especially have in mind the glands in the neck, we refer the case for surgical removal and continue the radiation at stated intervals for an indefinite period, depending on the results obtained. We endeavor to impress each patient with the wise necessity of returning for examination not only for a possible recurrence locally but, far more important, to determine, as far as possible, by every method of examination at our command, if the process has escaped and is seeking other worlds to conquer.

We are positive from a review of the world-wide reports on the treatment of malignancy of the mouth that this combination possesses

great advantages and gets more people well, either temporarily or permanently, than any other method. We are also firmly convinced that the clinics, where any one of these agencies is used to the exclusion of the others, suffer in the comparison of results with those where this combined radio-surgical method is employed.

These cancer victims are the most pitiable sufferers of afflicted humanity. To give them a few more years free from pain and stench would certainly be a great mercy as well as a profoundly brilliant medical accomplishment. That radiative treatment accomplishes this is admitted by all. For the most part it has been relegated to this limited and hopeless field. But, even here, burdened by a terrible handicap, a rear guard only in a most disastrous and perilous position, it has not been found wanting, but has demonstrated, in every such catastrophe, its incomparable worth. We have seen patients seemingly not far from death, weak, debilitated, and anemic, hopelessly awaiting the final call, wonderfully improved at the very start. The pain disappears. The habitual morphine can be removed. The cancerous absorption ceases. They begin to sleep better. Digestion becomes more normal. The profuse salivation, which is so pestiferous, is checked. The stench is removed and the hemorrhage ceases. Good spirits and good cheer replace depression and despair. Nature's natural stimulant—hope—though long deferred, returns. Nature now becomes more resistant. The red corpuscles rapidly increase. Metabolic processes become more active. From this extremely afflicted group we are able to rescue a small per cent. If this palliative feature of radiation was its only virtue it would still be one of the most wonderful remedies at our command.

An experience of only six months with this combination treatment is far too short to enable us to tabulate results of any value. In this brief period, treating entirely inoperable cases of mouth malignancy with the combination method, we have verified to our complete satisfaction, all the reports and claims of these pages as to immediate relief and apparent cure. The relief obtained, whether it be permanent or not (and we have every good reason to believe it will be in a small percentage), has amply justified this combination method and gives it great promise for the future.

Let physicians and dentists combine their knowledge and experiences in discussing, in

joint sessions, the early removal of chronic irritative influences and the early detection of pre-cancerous symptoms in the month. Let them lose no opportunity to inform their patients and the public, as far as possible, that a general proper view of malignancy may prevail; that to recognize pre-cancerous symptoms early or remove their cause is the heart of the cancer problem; that life is at stake; that delay and procrastination here mean death; that only prompt action can give hope of life.

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## NEURO-PSYCHIATRIC WORK IN THE ARMY.\*

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THE use of mental experts in an army is a very modern innovation. The first instance in the history of the world where mental cases were separately cared for by specialists from the front lines to the permanent home hospitals was in the Russo-Japanese War of 1904. Not, however, until the present World War did the astounding increase of mental and nervous affections bring in to overworked prominence a department hitherto relatively insignificant.

This increase of mental and nervous affections was so great in the English and French forces in the first months of fighting as to overfill all the hospital space both in the field and at home. From lack of facilities and mostly from lack of knowledge of how best to deal with these cases, the partly recovered were discharged disabled to the care of their relatives; and soon all England was full of pitiable war-cripples, potentially curable, but never getting better. At the time of the United States' en-

trance into the war it was reported that one-sixth of all disability discharges from the British Army had been for mental and functional nervous disease; or, if discharges for wounds were excluded, these nervous cases constituted one-third of all discharges for disability.

These few facts may give you gentlemen who have affiliation with hospitals in your home towns some idea of the difficult problem before the Surgeon-General's office in providing adequate hospital space for these cases and facilities for forwarding them from the front to special hospitals for their care and treatment. For it must not be forgotten that, from the nature of their symptoms, special attendants, constant supervision, and specially constructed wards were often necessary. About this time, too, our Allies had begun to realize that they had made a mistake in discharging many of these cases only partly cured; and, to profit by their experience, we had to provide adequate hospitals for prolonged treatment of possibly great numbers.

An effort which greatly diminished the incidence of nervous disability in our troops was instituted early in our Army and has been effective since the first few months of our participation in the war. This effort was based on the sound medical maxim, "remove the cause," and the realization that a great many of the potentially neurotic and unfit could be recognized and refused by local examining boards and by a careful psychiatric survey of recruits at all mobilization camps. Statistics are not available at present, but from my experience of over a year with those returning from abroad at a special mental hospital in this country, I think I am correct in saying that these precautions practically eliminated from the later troops those cases previously treated in insane hospitals, or otherwise mentally unfit for war service, who were all too numerous among the first volunteers who passed a far less efficient testing. The best way to treat war neuroses and psychoses is to *prevent* them. That this has been successfully done is a fact which will reflect lasting credit on the organization and efficiency of the neuro-psychiatric division of our medical corps.

In this brief survey of the neuro-psychiatric work of the Army we will consider—

1. Special examination of recruits in the mobilization camps.
2. The incidence, care, and transport of the mentally ill from the front lines in France to

\* Read at the Annual Meeting of the New Hampshire Medical Society, May, 1919.

the special treatment hospitals in this country.

3. The medical problems in the special hospitals for neuro-psychiatric cases.

1. Cantonment work. In conjunction with the regular examining surgeons, all recruits had to pass the neuro-psychiatric board. These examiners were greatly aided by the results of a previous group testing and grading by the camp psychologists. Generally, the psychiatric examination consisted of rapid observation for tremors, changed reflexes, thyroid enlargements, etc., and an estimate of mental history and capacity by a few questions. Where mental deficiency was suspected a standard intelligence test was given later; while all doubtful cases of any sort could be referred to the hospital for further observation. By this method each examiner could handle from one hundred to two hundred men a day.

As to the results of this examination in the various cantonments I will quote from a report by Colonel Bailey, of the Surgeon-General's office:—"Disqualifications based solely on the existence of nervous and mental disease or defect have been found in from one-half to five per cent., varying with the command examined. It is believed that most of them would not have been recognized by general medical officers. . . . Nearly three-fourths of the recommendations for discharge were for conditions primarily mental as opposed to organic disease or defect of the nervous system.

"Among the first 13,481 recommendations there were

Mental defect	4,737 cases, or 35.1%
Epilepsy	1,729 " " 12.8%
Psychoneurosis	1,542 " " 11.4%
Constitutional psychopathic state	1,239 " " 9.2%
Dementia præcox	800 " " 5.9%
Alcoholism	759 " " 5.6%
Manic depressive	257 " " 1.9%
General paresis	237 " " 1.8%

"It will be observed that of this large group of recommendations for discharge, 83.7% represented a class of case which is apt at some time or other to require custodial care; and that the elimination at the source of soldiers afflicted with any of the foregoing conditions is an essential part of the programme for the care of the military insane, to say nothing of its help in the forming of a strong army."

Besides doing these examinations the camp psychiatrist cared for acute cases needing treatment in the psychiatric wards of the camp hospital until they were discharged or until trans-

ferred to the special hospital of the district designated to receive the overflow.

Let those who esteem the employment of medical specialists an undue refinement of care in such a crisis consider this work and its results. What great expense and trouble were saved by eliminating these thousands of potential trouble makers from weakening the backbone of our Army and hindering its victorious march onward! The war was truly waged in France, but won in America. And none in France more truly did his bit than the modest camp psychiatrist doing his daily grind for months without let-up—steadily preventing trouble. I, fortunately, was not assigned to much such work; but I appreciate its arduousness and cannot overestimate its importance.

2. The nervously unstable broke down under the strain of active service both in the camps of this country and when en route to Europe. But the chief source of the neuro-psychiatric patients was the combat divisions in France, either during the strenuous training behind the lines or while actually engaged in trench warfare, exposed to all kinds of shell fire and reduced by overexertion to mental and physical exhaustion. The plans for caring for them had to be as complete and continuous and adapted to their needs as the plans for forwarding surgical injuries.

Suppose a group of shell-shock patients were brought into one of the advanced field hospitals behind the lines in France. Such cases, as soon as possible, would be sent by motor transport from this and other similar field hospitals to the common Evacuation Hospital some miles to the rear. Here they received more careful examination and attention than was possible further front, and might first meet specially trained psychiatrists.

These psychiatrists separated the incipient neuroses and treated them under combat conditions in wards attached to the evacuation hospitals, and were successful in returning to duty as high as 80% of these cases which formerly remained sick for months by fixation of their neuroses by hospitalization.

The evacuation hospitals were situated at railroad head. Thence these cases were transferred under special attendance as psychiatric cases by train to the psychiatric ward of a base hospital far in the rear. Here a great number recovered enough to return to camp duty and some to rejoin their comrades at the front. The rest were passed on to other similar hospitals until finally

they reached the port of embarkation. On the ocean transports special provision was made to accommodate the suicidal or violent, and thence they were disembarked at the debarkation hospital at Ellis Island, New York, Newport News, Va., or other ports on our Atlantic seaboard. Here they usually rested for a few days to recuperate from the voyage, and were re-classified according to the nature and severity of their symptoms and assigned for transfer to the several special hospitals that were best fitted by equipment and personnel to deal with particular classes. Thus, those suffering with the psychoneuroses without violent mental symptoms were sent to Plattsburg Barracks, New York, which, since last July, has received chiefly the neuroses and epileptics. Practically all those with severe mental symptoms have been sent to the General Hospital No. 4, at Fort Porter, New York. This was the first Army Hospital designated to receive overseas mental cases and was opened in the fall of 1917. Later, when its wards became over-crowded, other hospitals not far distant were opened to accept the milder forms of mental disease and convalescents, and were filled from Fort Porter by transfer. Thus the treatment and control under capable experts were continuous from the combat area in France to the final convalescent hospital at home. Here a large proportion of them got well and were discharged recovered, though some with chronic ailments existing before enlistment were transferred to state hospitals in their native states. The disposition of similar sickness in officers was different. Most of these were cared for in special wards at Bloomingdale Hospital near New York, and at Walter Reed Hospital near Washington, D. C.

This bare outline just glimpses the resting points in their itinerary, and I must leave it to your individual medical judgments to fill in all the details and difficulties in management, feeding, and care of these cases,—all of them mentally sick, many totally irresponsible, and not a few violent and vicious acting. From personal observation of sometimes over a hundred a day of these arrivals at their final destination, I have been impressed by their well-fed and generally comfortable physical state, in spite of the dust and stains of travel. No adequate idea can be gained of the work of this department of the medical corps without due consideration of the problems connected with the wholesale transport of mentally sick soldiers.

3. The advantage of permanent brick and stone construction for the prolonged treatment of neuro-psychiatric patients was so obvious that, as far as possible, permanent barracks buildings at several army posts were remodeled as psychiatric wards, while a few civil hospital buildings were leased for the purpose. The special hospitals at Fort Porter, near Buffalo, and at Plattsburg Barracks may be mentioned as good examples of this adaptation of old structures to new uses, while the well-known Jackson Health Resort served admirably as an army convalescent hospital.

In each, wards were light, well ventilated, and easily warmed in winter. An adequate hydrotherapeutic plant was installed for all kinds of water treatments, with special showers and continuous baths. All the departments of a general hospital were available to these cases. Thus there were the x-ray; eye, ear, nose, and throat; general and special surgical, and general medical departments in charge of particularly qualified men, while the laboratory facilities were such as are customary only in the largest cities. While these departments were constantly available for consultation and coöperation, the individual control and responsibility for treatment of the neuro-psychiatric patients lay with the trained psychiatrists in charge of these wards, most of whom had held state hospital positions in civil life.

Members of the Army Nurse Corps controlled the work of the wards and a nurse was on duty night and day on all wards. Among those patients partly responsible the presence and personality of female nurses is of distinct benefit to the morale and general neatness both of the patients and attendants, while their expert care and tenderness to the old or bed-ridden are of inestimable value. In our wards devoted to violent and vicious talking and acting irresponsibles, their efforts were bravely and loyally performed, but the real control and management of these wards necessarily devolved more upon the trained male attendants. Just as the members of the Nurse Corps at these hospitals were largely recruited from those having state hospital training, so the medical department men who served on the wards as attendants were selected for their previous experience in state hospital work or their ready adaptability and liking for the service. Some of these men at the hospital where I was stationed were graduate male nurses who had five to twelve years pre-



vious experience in all sorts of insane hospital work. Yet most of them were privates, except some few who could be made non-commissioned officers. A male nurse has no standing as such in the Army. Yet a very large part of the responsibility and expert control of insane-acting patients devolved upon and was efficiently performed by the attendants at Fort Porter. I will always look back upon them as the most loyal and efficient and expertly humane group of male attendants that I have met in twenty years' hospital experience. If the Army were to make permanent its present care of its insane in its own hospitals, some recognition of a trained attendant's status more distinctive and honorable than at present would seem advisable for the good of the service. These remarks imply no adverse criticism of the general efficiency of the Army Nurse Corps, but a well-trained, capable attendant is just as valuable as a nurse. His work may be supplementary to hers, but both alike are responsible for the comfort, control, and therapeutic efficiency of ward life, and both alike demand the best attributes of educated mind and heart.

Another group of helpers whose work counted large in the summary of general efficiency were called reconstruction aides. They were graduates of special schools where occupational therapy was taught. Their work in basketry, rug weaving, knitting, toy making and other diversional endeavors, both in the wards and work-rooms, stimulated interest and hope, directed impatient energies, and were of marked therapeutic value.

The chaplain, also, busied himself constantly in visiting the patients and arranging both for religious exercises and musical and other entertainments in the wards and assembly rooms.

With this material equipment and personnel a special psychiatric hospital in the Army received its patients from overseas and immediately started on its diagnostic decisions and therapeutic arrangements. Besides the usual physical examination and routine laboratory analysis of urine and blood Wassermann, a detailed mental examination was written out. If indicated, a special intelligence test was made to determine the degree of mental deficiency; and if the blood Wassermann proved positive, a spinal puncture and examination of the spinal fluid were ordered. All syphilites were actively treated, usually by venous injection of salvarsan, or its equivalent. All other physical ills besides

the psychoses for which these soldiers entered hospital were carefully attended to—teeth were looked after by the dentist, the eyes fitted to glasses, and other necessary work done by the appropriate specialist or general surgeon, and the case fully written up and presented to the staff conference, which decided the diagnosis, suggested treatments, and later reviewed the case before discharge. Many newly recovered psychiatric cases considered unable to undertake a long journey home alone were sent with an attendant and discharged on arrival; while the obviously chronic or incurable cases were transferred to St. Elizabeth's Hospital in Washington, or the State Hospital nearest their home.

Now, just a word as to the kind of patients included in the term neuro-psychiatric:

In the early months of the war, the effect of high explosives was so obviously a new cause of some mental incapacity that all the psychiatric cases were soon popularly referred to as "shell shock" patients, whereas we recognize among them the same clinical forms of mental disease as have been treated for years in civil hospitals. There is no new war psychosis.

That the effects of near-by explosion may shock a person into unconsciousness and even cause death without obvious physical injury has been repeatedly observed; and that those so injured who live may show changed reflexes, mental confusion, amnesia, and other effects similar to those of a contusion on the head from a "black jack" or a fall is likewise undisputed. These are the true "shell shock" patients, and have been numerous enough in this war to justify a separate classification. The great majority of "shell shock" neuroses cases, however, were never so shocked; many with typical symptoms never got near the fighting front; while some who did were injured by the fear of death, more than by any real accident. As in a stage of seasickness there comes a time when one is afraid he will *not* die, so to some of these soldiers, over-worn with onerous duty that simply had to be performed, any respite, even death itself, might seem preferable to "carrying on" further. In such a crisis, shell shock symptoms which incapacitated for service might be copied from others remembered or be suggested by the circumstances. That all these are generally mentally incapacitated and should be treated as major hysteria is admitted by all. The dogmatic Freudian theorists triumphantly announce the supremacy of the over-active unconscious mind,

while others, who admit their ignorance, partly content themselves with reference to a constitutionally unstable mental equilibrium, and group these as having subtle character defect. They remind one with court experience of the traumatic neuroses of tort cases against corporations. In some few of these cases intention to evade seems so near the forefront of consciousness as to suggest malingering—though grave malingerers themselves are generally psychopathic. Some have gone so far as to class these latter border-line cases as the only true lunatics, —because the true psychoses are known *not* to be influenced by the moon, and this class, they claim, reflect some of its golden color. In this connection they cite the newspaper report from General March that of 5,000 neuroses cases in France awaiting to be sent home, 2,000 recovered within twenty-four hours of the signing of the armistice. All of you doctors have numerous hysterical persons among your most capable families and may judge from your own troubles with them the problem of "false shell shock" in the Army. But a full discussion of the clinical forms of mental affection in soldiers is too great a subject to open up at this time. They are mentioned merely to complete our reference to the medical problems of the neuro-psychiatric division.

I realize that it is an impossible task in twenty minutes adequately to describe the multifarious duties and activities of this department of our medical corps, and I have purposely left out all reference to the constant training in army procedure and other purely military aspects of the work. My object has been to present a bird's-eye view of the magnitude and importance of these duties and the multitudinous problems that relate to this specialty; and, incidentally, to show how carefully and well worked out all efforts were put forth to insure these unfortunate soldiers as efficient care and medical attention as could be obtained by civilian patients in our best civil hospitals.

NEW JERSEY SURVEY OF MIDWIFERY.—A survey is being conducted in New Jersey to determine the conditions of midwifery in the different counties and conferences are being held in various sections for the benefit of midwives and for the discussion of supervision of babies and homes.

## OBSERVATIONS ON THE TREATMENT OF VESICAL CALCULI. AN ANALYSIS OF 455 CASES FROM THE MASSACHUSETTS GENERAL HOSPITAL.\*

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THE Massachusetts General Hospital saw the final development of the lithotrite and the evacuator in the hands of the late Dr. Henry J. Bigelow in the 70's. Successive generations of house pupils and staff surgeons have been taught the art handed down from the master, so that those of us of a younger generation turn naturally to lithotripsy and litholapaxy as the operation of choice in the great majority of cases of vesical calculi. Yet as one travels around from hospital to hospital, whether it be in Boston or elsewhere, it is obvious that, with few exceptions, the suprapubic operation is the one most generally resorted to. Being somewhat confused by this apparent divergence of views as to the most satisfactory methods of approaching these cases, it was decided to let the records tell their own story.

I have accordingly collected 455 cases of vesical calculi from the hospital records, going back from the present time to about 1870, when lithotripsy and litholapaxy were receiving their finishing touches at the hands of Dr. Bigelow. There were 392 cases of lithotripsy and 63 cases of suprapubic cystotomy. No selection of cases has been undertaken except to exclude those in which, owing to other operations or conditions, the desired data might be vitiated.

Certain generalizations are of interest. Of the entire series of 455 cases, 442 were in the male. Thirty-two per cent. of these occurred between the ages of 60 and 70, 67% between the ages of 50 and 80. The youngest patient underwent a lithotripsy at the age of three years and recovered; the oldest submitted to the same operation at the age of 88 and died. The mortality of the whole group was 9.5%. Ninety-four cases (20.5%) were recurrent, 40 or 42.5% after lithotripsy, 10 or 10.6% after suprapubic cystotomy, both of these operations having been done more than once in several instances. The records do not state the nature of the previous operation in the remainder.

To simplify matters the data peculiar to the suprapubic cystotomies will first be set forth. There were 63 in this group, and in 12 the

\* Read at the thirty-first annual meeting of the American Association of Genito-Urinary Surgeons, Atlantic City, June 16, 1919.

surgeon essayed a lithotripsy, but owing to the size or hardness of the stone, or some other difficulty not mentioned in the records, a suprapubic operation was finally resorted to. The anesthetic was ether in 48, gas and ether in 16, gas and oxygen in 3, spinal in 4, and local novocain in 1. The bladder was drained by a suprapubic tube alone in 14, by an inlying catheter in 40, by both routes in 16, while in two cases no drainage whatever was used. There were numerous complications during or after operation. Four cases developed epididymitis, serious wound infection took place in 11, "uremia" intervened in 6, the peritoneum was accidentally opened at the time of operation in 2, subsequent peritonitis developed in 1, another had a periurethral abscess, 2 suffered from excessive extravasation of urine, and 2 others contracted pneumonia.

The group of 393 cases of lithotripsy has also its points of interest. Ether alone was administered in 332, gas and ether in 22, gas and oxygen in 5, spinal anesthesia in 20, while in 10 the urethra alone was anesthetized with alypin or cocaine. Bladder drainage was carried out in only 119 cases, the remaining 272 patients being denied this undoubtedly considerable advantage. The complications peculiar to this group include epididymitis in 13 cases, "chills and fever" in 11, persistent hematuria in 9, periurethral abscess in 4, anuria in 3, and temporary postoperative incontinence in 2 (both in women). From two to five sittings at intervals of as many days and sometimes lasting from one to two hours were found necessary for the complete removal of the stone in 18 cases; in 7 there were multiple stones, and in 5 foreign bodies were found to be the nucleus of the stone. In three cases the jaws of the lithotrite could not be closed tight owing to the accumulation of crushed stone and the instrument had to be removed by perineal urethrotomy. Diverticulum of the bladder (one in a female) was noted in 3, and in each the difficulties of the operation were enormously increased by its presence. In one case it was noted that the stone was strongly adherent to the bladder wall. The largest stone mentioned in the records had a diameter (as measured by the lithotrite) of  $2\frac{1}{4}$  by  $1\frac{1}{2}$  inches, while the heaviest stone weighed 1350 grains.

In comparing certain items of the two groups some interesting facts are brought out. Postoperative residence in the hospital averaged

35 days for the cystotomy cases, 11 plus days for the lithotripsy cases. The longest stay of a lithotripsy case was 74 days; the shortest 1 day (there were several of these); the longest residence of a cystotomy was 105 days, the shortest 11 days.

Comparison of the mortality of the two groups shows 26% for the suprapubics and only 7.25 for the lithotrities. As regards the causes of death, "uremia" (so recorded) leads in each, 7 in the former and 9 in the latter. Sepsis caused four deaths in the suprapubic group and pneumonia, shock, peritonitis, and extravasation of urine each one case. In the lithotripsy group further causes of death are stated to be pneumonia in 6, cardiac failure in 4, peritonitis in 3, rupture of the urethra in 2, and gangrene of the bladder in 1.

By division of the whole series of cases into decades from 1870 to date and comparing common factors, some interesting features are brought out. No suprapubic operations were performed between 1870 and 1890, so that the cases studied in those years comprise only lithotrities. In the first decade the mortality was 10.3% and the average postoperative stay in the hospital was 19 days. The bladder was drained in but 1 case.

In the next decade (1880-1890) the mortality was 9.8%, and the average stay in the hospital 15 days. Bladder drainage was resorted to more frequently, but only in about 11% of the cases.

Beginning with 1890 we have suprapubic operations to reckon with and to compare with lithotrities. From 1890 to 1900 there were 124 of the latter and 17 of the former. The mortality of the suprapubics was 53% while that for the crushing operation was but 4.9%. The contrast in hospital residence is equally striking, for that of the cystotomies was 43 days, while for the lithotrities it was but 9 days. In the latter group bladder drainage was employed in about 35% of the cases.

From 1900 to 1910 the total number of cases of vesical calculi (appropriate for this analysis) fell off considerably, there being but 92, of which 58 were lithotrities and 34 were cystotomies. Whereas in former decades ether alone was used as an anesthetic, in this period the combination of nitrous oxide with ether was frequently employed and gas oxygen occasionally. Local anesthesia of the urethra was done 8 times. Suprapubic mortality fell in

this decade to 10%, whereas that of lithotrities, while still making a better showing, rose from 4.9% to 7.01%. Days in the hospital remained practically the same (9 days) after the crushing operation, whereas after cystotomy it dropped to an average of 34 days.

Sixty-seven cases were collected from the records from 1910 to date. Lithotripsy was done 45 times and cystotomy 22 times. In addition to the anesthetics already mentioned as being used in the previous ten years, spinal anesthesia now came into use (24 cases). Mortality of lithotripsy for the past 9 years has been 2.2% as compared with 13.6% for the suprapubic cystotomies. The latter have remained in the hospital an average of 29 days, the former an average of 7 days.

Given a case of vesical calculus, which is the best operation as regards mortality, stay in hospital, and possibilities of recurrence? The foregoing statements of fact show convincingly that while the prospects of recurrence of the stone (or, let us say, incomplete removal of the fragments) is considerably more with lithotripsy than with cystotomy, the other two factors (mortality and hospital residence) are so much more in favor of lithotripsy that it would appear to be no argument.

Let it not be forgotten, however, that the lithotrite and the evacuator are very special instruments and that they require special skill for their proper use. In the hands of the rough or untrained general surgeon either implement, especially the lithotrite, may do great damage. Such an individual should certainly do a cystotomy rather than a crushing operation. Furthermore, there are certain definite contraindications to the use of the lithotrite even in skilled hands. Diverticulum of the bladder may make the performance of lithotripsy exceedingly difficult, or even impossible. Obstructing prostate should be treated as such, the stone being regarded as a secondary affair; very large stones which exceed the limits of the jaws of the lithotrite or which prevent sufficient distention of the bladder with fluid; these are among the chief contraindications to the crushing operation. Each case must be decided upon its own merits and the surgeon must decide whether a well done suprapubic cystotomy is likely to produce more harm than a poorly done lithotripsy and litholapaxy.

In conclusion I wish to lay special stress on

the following points which a study of 455 cases of vesical calculi has brought out.

1. The combined mortality of lithotripsy and suprapubic cystotomy is 9.5%. Of lithotripsy alone the mortality is 7.23%; of suprapubic cystotomy it is 25%.

2. Recurrence is to be expected in at least 20%, especially where the previous operation was lithotripsy.

3. After lithotripsy patients may expect to stay in the hospital an average of about 11 days, although a great many cases are able to leave earlier than this (often in 2 or 3 days). After suprapubic cystotomy the average stay is about 35 days, although in favorable cases this time may be considerably shortened.

4. Bladder drainage is of undoubted value in the after care of cases of lithotripsy and litholapaxy; in cases of cystotomy it is an essential.

5. The choice of the proper anesthetic undoubtedly plays an important part in the outcome of these cases.

6. Barring certain obvious contraindications to its performance, lithotripsy undoubtedly is the operation of choice. Among these contraindications is the general surgeon's lack of training in the use of the lithotrite and evacuator.

7. The steady fall in the number of cases of lithotripsy and suprapubic cystotomy shown in the hospital records from about 1900 to the present time is due neither to a growing scarcity in the number of stones nor to an increasing unpopularity of the hospital. As a matter of fact more stones have been removed from the bladder during these years than ever before; but owing to modern methods of diagnosis the stone has been relegated more and more to second place, while the underlying cause (obstructing prostate, alkaline urine, diverticulum, etc.) have commanded the surgeon's attention.

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APPEAL OF THE ITALIAN WAR RELIEF FUND.  
—The Italian War Relief Fund of America has issued an appeal for materials to be forwarded to Italy for the making of clothing for Italian men and women. The committee has stated that tubercular children are dying in great numbers, thus placing the next generation of men and women in great danger.

## Clinical Department.

### OPERATION FOR ACUTE MASTOIDITIS AT AGE OF 84, WITH RECOVERY.

By EDMUND J. BUTLER, M.D., CAMBRIDGE, MASS.,

*Visiting Aurist and Laryngologist to the Cambridge Hospital.*

GEORGE W., aged 84, was admitted to the wards of the Cambridge Hospital on May 5, 1919, with an acute bronchitis. Past history negative, except for two attacks of erysipelas. He had no previous history of ear trouble; hearing always acute; appetite always good, and constitution sound, with only a slight palpable sclerosis of arterio radialis.

During the first ten days in the hospital the patient had a slight variation of temperature ranging between 98 and 99 degrees. He coughed frequently and raised vast amounts of thick, yellow sputum, cultures and smears of which showed staphylococcus and streptococcus. No tubercle bacilli were found.

May 17, twelve days after admission, the patient complained of pain in left ear. His temperature rose from normal to 102 degrees, but he had no chill. Lungs were negative, except for a few scattered moist râles transmitted from the bronchi. Consultation with Dr. Shannon, six hours after patient first complained of pain, showed a left auricle tender to touch, and very slight tenderness to pressure over antrum. There was no tenderness over tip of edema of skin over mastoid. The floor of the canal was covered with tenacious, foul-smelling pus. The drum was ruptured spontaneously in the posterior inferior quadrant, giving the middle ear cavity sufficient drainage. The tympanic membrane was bright red and the handle of the malleus was just perceptible. Frequent hot borie irrigations, heat to the mastoid and argyrol 20% to the pharyngeal orifice of the left Eustachian tube failed to bring relief after forty-eight hours. The temperature remained elevated; the mastoid from the antrum to the tip became very tender to touch, with marked edema of the sub-cutaneous tissues over this area. The posterior superior canal was bulging with the middle ear cavity draining freely through the opening in the drum. The pain was constant and the patient begged "to have something done for relief of the pain."

After consultation with Drs. N. V. Shannon, Albert August and C. M. Hutchinson, it was de-

cided to open the mastoid. Because of the age of the patient and his bronchial condition, which had shown marked improvement since admission to the hospital, the operation was done under local anesthesia.

Morphine sulphate gr.  $\frac{1}{4}$  sub-cutaneous was administered and the usual mastoid preparation made. Anesthesia was administered by Dr. Hutchinson, 2% solution of cocaine being injected into the canal and  $\frac{1}{2}$ % solution into the sub-cutaneous tissues over the mastoid. The usual incision was made, the cortex opened in the suprameatal triangle with a chisel, and the antrum cleaned. The remaining cortex that had to be removed was broken away with a Yensen bone forceps. The mastoid cells, which showed but very slight sclerosis, were filled with a thick, foul-smelling pus, a culture of which showed staphylococcus and streptococcus.

After cleaning out the antrum and cells a wick was inserted for drainage. The patient left the operating room free from pain, with a pulse of 78 and of good quality. He stated he had no pain during the operation except when the bone was chiselled into.

Two days after the operation the dressing was changed and considerable pus drained from the open wound. The temperature dropped to normal after the first dressing and remained so for five days, when a low grade erysipelas developed over the left side of the scalp. This condition lasted ten days: the mastoid filled in with granulation tissue, and the patient had an uneventful convalescence. He was discharged from the hospital June 22, with the incision healed, hearing normal, and in good physical condition.

### CASE REPORT OF HYPERPITUITARISM AND HYPERGLYCEMIA.

By F. VAN NÛYS, M.D., WESTON, MASS.

Mrs. E. M., aged 63, entered the Waltham Hospital on June 27, 1919. Family history negative. Past History: Two children living. No miscarriages. Menopause at 45. Robust and well nearly all her life. Six years ago laparotomy for "abdominal tumor." Influenza last winter. For some years has been subject to vague body pains with occasional swelling of hands and feet.

About four years ago symptoms of diabetes

began—polydipsia, polyphagia, polyuria, pruritus, and loss of weight. She now weighs 140 where she used to weigh 240 pounds. A diabetic diet gave her much relief.

At rare intervals she has attacks of dizziness with headache and painful retention of urine for twenty-four hours at a time. Seven months ago and three weeks ago she vomited without known cause. Not projectile. For some time before the present illness she has been in good condition, active and lively, and on unrestricted diet.

Present illness: On June 26, out of a clear sky, she was taken with nausea, vomiting, dizziness, diarrhea; and, gradually, with coma. Physical examination: A short, well colored, well developed French Canadian, with heavy cheek bones, broad nose and undershot jaw, in coma. Acetone odor on breath. Sugar dermatitis about vulva. Skin dry and rough. Extremities not enlarged. Heart and lungs not remarkable. Abdomen protuberant with bladder swollen to navel—relieved by catheter. Neither liver nor spleen palpable. Pelvic examination negative. Reflexes normal. Urine: 1036, no albumen, sugar 5½%, acetone and diacetic acid four plus. Some pus but no blood or casts in sediment. The 24-hour amount was impossible to obtain because of involuntary urination. Apparently the amount was not much increased over normal.

The usual Allen treatment for diabetes was instituted. Five days later she became sugar-free on 90 gm. carbohydrate, not requiring complete starvation. The diacetic acid, however, persisted for three days longer. With decreasing acidosis her mind cleared, although sphincter control was not regained for some time. Occasionally she vomited. Great difficulty was found in getting her to take food. For the first ten days the most she took on any one day amounted to less than 500 calories. Thereafter her appetite increased satisfactorily. When the 24-hour carbohydrate intake reached 250 gm. her urine showed .5% sugar. This quickly disappeared under limited carbohydrates. At no time did her acidosis return. Occasionally her stools showed blood (piles?), but otherwise were not abnormal.

Blood pressure taken daily kept between 124 and 140 mm. systolic. White count was 14,000. Temperature, pulse, and respiration kept normal.

Blood sugar, taken fasting after urine was sugar-free for 18 days, was 290 mgm. per 100

c.c. of blood (Dr. F. L. Burnett), indicating a high renal dam for sugar.

Hyperpituitarism was suspected from her facies and glycosuria. Repeated roentgenograms of the skull seemed to show a much enlarged sella turcica. The shadows were obscure as if a growth partly obliterated the outlines of the region.

Throat and eye examinations by Drs. C. T. Porter and R. C. MacKenzie showed normal pharynx, eye-grounds, and fields of vision.

Spinal puncture gave 40 cc. clear fluid under some pressure. Wassermann negative. Globulin not increased. Cell-count 5 per cubic millimeter. The blood Wassermann also was negative.

Pituitrin was given without appreciable effect. Potassium iodide seemed to be of decided benefit. Finally she was able to sit up and walk a little. On July 27 she was taken home.

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### Book Review.

*Nervousness, Its Causes, Treatment, and Prevention.* By L. E. EMERSON, PH.D. Boston: Little, Brown and Company. 1918.

Nervousness is a condition which may be eliminated often by some slight adjustment in one's mental attitude. This is particularly true of nervousness resulting from functional, rather than organic, disorder. The author of this volume has shown a remarkable insight into the causes of nervousness and offers practical suggestions for treating and preventing this condition. He emphasizes the importance of studying personality, of analyzing personal and social consciousness. Inability to cope with situations and to adjust one's self so that one's reaction to the social environment is harmonious can be overcome by intelligent training. This guidance should be tendered to children as soon as their instincts and desires begin to develop. Repression of some normal instinct in childhood frequently causes the exaggeration of some fear and develops into an abnormal state of mind which will result in a nervous breakdown later in life. This book points out how an understanding of mental processes may help a patient to overcome conditions which are simple and remediable if they are understood and squarely faced, and of complex and serious nature if fostered by a secretive and neurotic temperament. This is a book of constructive character and may be strongly commended to persons suffering from nervous disorders.

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## RECURRENCE OF INFLUENZA EPIDEMIC.

The possibility of a recurrence of influenza this winter has been discussed by Surgeon-General Blue in an official bulletin, in which he states that although the epidemic will probably recur this year it is not likely to be so severe as during last winter. He urges state and city officials and boards of health to be prepared.

It is known that influenza is spread by direct and indirect contact; but because it is not yet certain that the germ has been isolated, there is no preventative on which we can rely with assurance except the enforcement of rigid rules of sanitation and the avoidance of personal contact. It is probable that there was a close relation between the influenza pandemic and the constantly increasing pneumonia mortality rate prior to the fall of 1918, and it is to be hoped that a lesson has been learned from this failure to recognize the early cases. The mor-

tality statistics of the United States show that there were a number of extensive though mild forerunners during the three or four years preceding the epidemic last winter. The studies of the Public Health Service indicate that the disease was not an importation from abroad.

Although there is as yet no conclusive evidence on this point, we have reason to believe that an attack during the earlier stages of the epidemic conferred a considerable but not absolute immunity in the later outbreaks. One thing, however, is certain,—that whatever the micro-organism may be, it is communicable from person to person, and it is probable that the germ is carried about not only by persons ill with influenza, but also by some who are entirely well. The report of the Surgeon-General states that it is probable that we may expect at least local recurrences, with an increase over the normal mortality from pneumonia for perhaps several years, and urges that we be prepared to meet them by previous organization of forces and measures for attempted prevention, treatment, and scientific investigation.

## SIR WILLIAM OSLER.

In a recent issue of *Science* there is an account of the presentation made to Sir William Osler, Regius professor of medicine in the University of Oxford, on July 11, 1919, his seventieth birthday. Two anniversary volumes containing medical contributions by English and American colleagues were presented by Sir Clifford Allbutt of the house of the Royal Society of Medicine on behalf of about one hundred and fifty subscribers and contributors.

Sir William Osler, honored equally by Great Britain and America as an eminent leader in medicine, beloved by his professional colleagues, his students, and the sick with whom he has come in contact, has devoted his life and service to the advance of medical science. During his life, he has held the chairs of medicine at McGill University, the University of Pennsylvania, the Johns Hopkins University, and Oxford. His knowledge of pathology was acquired in his early days at Montreal; his training and the fact that for many years he has taught medicine to students not from text-books, but by direct contact with the sick, have made possible his eminent position in clinical medicine.

Although not a laboratory physician, but a man who was devoted to his patients and his pupils, Sir William Osler has made a number of discoveries of profound significance to medical progress. He described the blood platelets in 1874 which he was the first to define as the third corpuscle of the blood in relation to the formation of thrombi. Among his other contributions to medical science may be mentioned his discovery of the parasite of verminous aneurysm and the relation between mycotic aneurysm and mycotic endocarditis, and his description of the ball-valve thrombus at the mitral orifice, the visceral complications of erythema multiforme, chronic cyanosis with polycythemia and the erythematous spots in malignant endocarditis. These represent in part the achievement of Sir William Osler, deservedly the recipient of the honor and esteem of the entire medical profession.

#### THE BOSTON CITY HOSPITAL.

THE fifty-fifth annual report of the Boston City Hospital includes a record of the work accomplished during the year 1918 by the main hospital, the South Department for infectious diseases, the Haymarket Square Relief Station, and the Convalescent Home in Dorchester. The entire expenditure for all departments of the hospital for maintenance during the year amounted to \$974,374.69.

The Boston City Hospital's contribution to the war was considerable, both at home and abroad. Many members of the Hospital staff, nurses, and employees have been in military service. Base Hospital No. 7, organized at the Boston City Hospital with Dr. John J. Dowling, superintendent, as its director, was mobilized at Camp Devens in February, and in July left this country for France, where it was stationed at Tours. The efficient work of this unit in caring for three thousand beds merits high commendation. The first convoy of returned wounded soldiers to reach the hospital arrived in July, where they remained until reassigned to army hospitals. In August it was necessary to give up two entire wards to the treatment of a second convoy. The West Department was turned over to the War Department as a part of the United States General Hospital Number 10. Altogether seven hundred sick and wounded soldiers and sailors were cared for at the Bos-

ton City Hospital during the war. During the summer of 1918, a training school for hospital apprentices was formed at the request of the Medical Department of the First Naval District, and a six weeks' course of theoretical and practical work in caring for patients was given to 225 men.

The war and the influenza epidemic have given the hospital opportunity for unusual service during the year. The first influenza patients were received early in September, and during September and October the hospital capacity was taxed to the utmost and the personnel tested almost beyond endurance. Between September and January, there were approximately 2300 cases, with 675 deaths. Many of the physicians and nurses became ill; two physicians, nine nurses, and four employees paid with their lives for the heroism exhibited throughout the hospital.

In spite of the extra demands upon the hospital during the year, its regular routine activities have been maintained with efficiency and devotion. The reconstruction of ward buildings E and A, completed October 1, have added two new wards. A total number of 17,506 patients were cared for during the year, of whom 5,935 received medical treatment, 6,686, surgical, and 1,951 gynecological and obstetrical care. There were 622 births during the year. Thirty-eight thousand and twenty-three persons were treated in the Out-Patient Department, 8,127 by the X-Ray Department, and 408 by the Vaccine and Serum Therapy Department. The hospital has at present a total capacity of 1,173 beds, of which 765 are in the hospital proper, 340 in the South Department, 24 in the Haymarket Square Relief Station, 10 in the East Boston Relief Station, and 34 in the Convalescent Home.

The work of the X-Ray clinic is increasing each month. The use of gas tubes has been entirely discarded, and only Coolidge tubes are being used. It is hoped that a bedside unit may be installed during the coming year for the examination of ward patients who cannot be safely transported to the X-Ray Department. The teaching facilities, especially in the fluoroscopic study of fractures and other cases, have been greatly improved.

The Department of Vaccine and Therapy has been prepared to carry out the preparation of convalescent serum for treatment of influenza pneumonia since November. In addition to the



administration of protective and curative treatment to 559 persons, and a total number of 2,757 out-patient clinic visits. The laboratory work has consisted of bacteriological diagnosis, preparation of vaccines and antigens for diagnosis and treatment, and a supply of solutions necessary for preparation of diarsenol. Research work was carried on with protective inoculation against lobar pneumonia.

The work of the Pathological Laboratory has been handicapped by the departure of its five trained medical men and three technical assistants into war service. The regular routine work has been carried on, however, although it has not been possible to finish any research work for publication.

The report of the hospital's Medical-Social Department, which was first organized in 1914, shows that this department has steadily increased its activities since that time. One thousand nine hundred and sixty-nine patients have been cared for in various ways during the past year. The Training School for Nurses completed last year its forty-first year. Sixty probationers and nineteen college women from Vassar Training Camp were admitted in 1918, and thirty nurses were graduated. Twelve nurses have finished the obstetrical training given at the New England Hospital for Women and Children and two have finished the courses in Public Health Work.

In all departments, the Boston City Hospital has been taxed to the utmost during the past year. The courage and faithfulness with which its staff carried on its service under the most difficult conditions will be gratefully remembered in the history of the institution.

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### MEDICAL NOTES.

**AWARD OF THE REMINGTON MEDAL.**—At the sixty-seventh annual meeting of the American Pharmaceutical Association held recently in New York City, the Remington Medal was awarded to Prof. James P. Beal. This medal is given annually to the member of the American Pharmaceutical Association who makes the most notable contribution toward the advancement of pharmacy.

**RED CROSS AND FEDERAL AID FOR TEXAS.**—The Red Cross has recently received a report from the Red Cross physician at Corpus Christi,

Texas, stating that four thousand persons were homeless, one in fifty estimated dead, and that there was a property loss of ten million dollars. One train carrying supplies of food and clothing, doctors and nurses and relief workers has already arrived in the flood district, and another train and a government vessel is on the way with relief supplies.

**MAJOR-GENERAL WILLIAM C. GORGAS.**—It has been reported that Major-General William C. Gorgas, former Surgeon-General of the United States Army, has offered to assume technical directorship of the sanitation of Guayaquil, Ecuador, provided the money for the work is supplied by the municipality or the republic. He has been investigating the sanitary conditions in Central and South America, and is about to proceed to Piura, which is infected with yellow fever, at the request of the Peruvian authorities.

**AMERICAN MOBILE HOSPITAL IN THE BALKANS.**—A recent report from Bucharest states that wounded Rumanians and Hungarians have been treated in an American mobile hospital. This type of mobile hospital is known as the "auto-chair," and is carried on eighteen huge automobile trucks constructed for medical and surgical purposes during war time. It consists of automobile operating rooms, sterilizing equipment, a laboratory, a pure-water machine with an ice-making attachment, an x-ray car, electric light plant, steam heating plant, a blacksmith's repair shop, and a complete tent hospital which can be set up anywhere in about two hours and will accommodate more than four hundred wounded men.

The Hospital was built by the Red Cross for use on the West front, but did not arrive in Europe until after the signing of the armistice. It has been given to Queen Marie of Rumania by the American Red Cross and is under the command of Major J. B. Bayne of Chicago.

**COURSE IN PUBLIC HEALTH NURSING.**—An eight months' course in public health nursing and industrial nursing was begun at the School of Public Health Nursing, conducted by Simmons College and the Instructive District Nursing Association, on September 16. Twenty-four graduate nurses have enrolled in the public health course and two in the industrial nursing course. The latter is a new course which is

offered by a special arrangement with the Committee on Industrial Hygiene of Harvard University and will be open only to those graduate nurses who are also college graduates; nurses who complete it will receive certificates from Simmons College, and may also receive the degree of Bachelor of Science.

**BEQUESTS TO HOSPITALS.**—By the will of the late Almira Elliott of Haverhill, the sum of \$1,000 was bequeathed to the Steven H. Gale Hospital of Haverhill and to the Anna Jacques Hospital of Newburyport.

**STUDY OF INFLUENZA AT HARVARD UNIVERSITY.**—It has been announced that exhaustive research into the causes, effects, and complications of influenza, together with their prevention and cure, will be carried on by the laboratories of Harvard University. This work has been made possible by a gift of \$50,000 by a corporation which suffered losses during the epidemic last year. The greater part of this sum will be used by Dr. Milton Joseph Rosenau, Professor of Preventive Medicine and Hygiene of the Harvard Medical School, and a corps of assistants. The research will be carried on in connection with Dr. Rosenau's teaching in the medical school, and the students will have the benefit of his discoveries.

**WARNING ABOUT INFLUENZA.**—Dr. William A. Brooks, former acting surgeon-general of Massachusetts, has commented upon the warning which has been issued by Surgeon-General Blue of the United States Public Health Service. He is reported to have said that this warning should be heeded by the public and all health authorities, as past experiences have shown that epidemics are repeated for at least three years, growing less violent each year. He believes that conditions are less unfavorable than last year, for then the naval stations and training camps caused a concentration of men which led to a rapid spread of the disease. One of the causes for concern at the present time is the shortage of nurses, and appeals have been made by a number of institutions for applicants. Dr. Brooks is reported to have made the following statement:

"Persons suffering from a cold should take care of themselves as a preventive measure. They should at least remain indoors and call a physician. This precaution will protect the per-

sons suffering from cold and others as well. By not calling in a physician and having the disease diagnosed, others are endangered. To keep the cases isolated should be the aim of all families in which there is a person ill with influenza. Grouping the cases in the last epidemic was the cause of the exceptionally high mortality.

"Preparedness will save a repetition of last year's heavy mortality. Health authorities should be so prepared that they can act just as soon as the epidemic appears in any community, and thus save the misery through which Boston, Massachusetts, and the country passed last year. The public should also play its part in case of the recurrence of the disease."

**GIFT TO NOBLE HOSPITAL.**—A gift of \$1,000 has been made to the Noble Hospital by John Davis, a former resident of Westfield.

**MEDICAL AID FOR RETURNED SOLDIERS AND SAILORS.**—All Massachusetts posts of the American Legion have been notified that returned soldiers and sailors in need of medical attendance as a result of their service abroad are entitled to the aid of the Public Health Service, through its relations with the War Risk Insurance Bureau. The headquarters of District Number 1, all the New England States with the exception of Connecticut, is at 51 Cornhill, Boston, which is in charge of Surgeon W. W. King. Dr. King may appoint a local physician to care for cases in remote districts, as a representative of the Public Health Service.

**ELECTION OF DR. JOSEPH B. HOWLAND.**—Dr. Joseph B. Howland, administrator of the Peter Bent Brigham Hospital, has been elected president of the American Hospital Association, which is holding a convention in Cincinnati.

**ANNIVERSARY MEETING OF THE STATE BOARD OF HEALTH.**—The fiftieth anniversary of the formation of the State Board of Health which was to have been held on September 15 in Boston, has been postponed indefinitely because of the unsettled conditions in the city.

#### BOSTON AND MASSACHUSETTS.

**WEEK'S DEATH RATE IN BOSTON.**—During the week ending September 20, 1919, the number of deaths reported was 147 against 491 last year, with a rate of 9.62 against 32.64 last year. There

were 27 deaths under one year of age against 60 last year.

The number of cases of principal reportable diseases were: Diphtheria, 4; scarlet fever, 32; measles, 7; whooping cough, 19; typhoid fever, 2; tuberculosis, 47.

Included in the above were the following cases of non-residents: Diphtheria, 3; scarlet fever, 7; whooping cough, 1; tuberculosis, 11.

Total deaths from these diseases were: Diphtheria, 1; whooping cough, 1; tuberculosis, 15.

Included in the above were the following non-residents: Whooping cough, 1; tuberculosis, 1.

Influenza cases, 15; last year, cases not reported; influenza deaths last year, 172.

#### NEW ENGLAND NOTES.

WAR RELIEF FUNDS.—Contributions to New England War Relief funds have reached the following amounts:

French Orphanage Fund . . \$516,068.57

Italian War Relief Fund . . 302,916.55

French Wounded Fund (for

American Memorial Hos-

pital) . . . . . 193,420.27

BEQUESTS TO HOSPITALS.—By the will of the late David E. Murphy of Concord, N. H., \$1,000 was bequeathed to the Concord District Nursing Association, and \$500 each to the Women's and Children's Memorial Hospital and the Margaret Pillsbury General Hospital of Concord.

ANNUAL MEETING OF JEFFERSON COLLEGE GRADUATES.—The 14th annual meeting of the New England Association of the Graduates of Jefferson Medical College of Philadelphia was held at the Copley Square Hotel, Boston, Thursday, Sept. 18, 1919. The business meeting took place at 6.30 P.M. and the banquet at 8 P.M.

The meeting was called to order by President Eckley R. Storrs of Hartford, Conn., and, after reading the minutes of the previous meeting, which was held at Hartford, Conn., the following officers were elected for the ensuing year: President, Dr. E. Winfield Egan, Brockton, Mass.; Vice-President, Dr. W. T. Veal, Stonington, Conn.; Treasurer, Dr. Frank I. Payne, Westerly, R. I.; Secretary, Dr. Wallace P. MacCallum, Boston, Mass.

At the banquet Dr. John T. Farrell of Providence, R. I., acted as toastmaster and introduced the following speakers:

Prof. Randle C. Rosenberger, Professor of Hygiene and Bacteriology of Jefferson College. Subject: Jefferson Medical College of the Past, Present, and Future.

Dr. C. Allen Riley of Boston. Subject: The Treatment of Tuberculosis in the Different Sanatoria.

Dr. James A. Mansfield, Dorchester, Mass. Subject: Various Methods of Encouraging Alumni Enthusiasm.

Dr. James J. Goodwin, Clinton, Mass. Subject: Post-Graduate Work at Jefferson.

Dr. Wallace P. MacCallum of Boston. Subject: The Best Way to Keep Members of the Alumni Association in Close Touch with One Another.

Dr. E. Linden Mellus, Brookline, Mass. Subject: Jefferson Medical College in the Olden Days.

Dr. E. Winfield Egan, Brockton, Mass. Subject: Influenza and Its Treatment.

At 11 P.M. the banquet party adjourned, after voting to hold the next annual meeting at Providence, R. I.

### The Massachusetts Medical Society.

#### NOTES FROM DISTRICT SOCIETIES.

Dr. John C. Lindsay, Lieut. M. C., U.S.N., has received his discharge and has been appointed assistant superintendent of the Norfolk County Hospital at South Braintree.

Dr. Marie S. Lindsay has resigned from the staff of the Worcester State Hospital.

Dr. Fred E. Jones of Quincy has been appointed consulting surgeon to the Norfolk County Hospital.

Dr. C. A. Sullivan of South Braintree has been appointed consulting physician to the Norfolk County Hospital.

Dr. Frederic B. M. Cady of Cambridge, Mass., has just been discharged from service and returned home September 26. He was overseas during the early part of the war, and for the past year has been at Fort Lee.

Dr. Clarence P. Curley has returned from service in the U. S. Navy and has resumed practice at 234 Commercial Street, Provincetown. He was on service with the Naval Aviation Corps in Paris and near Bordeaux, and was placed on the retired list with the rank of Past Assistant Surgeon.

**NEW FEE SCHEDULE IN FALL RIVER.**—At a largely attended meeting of the physicians of Fall River, held September 27, it was voted to adopt a schedule of fees now charged in Lawrence, Lowell, Brockton, Taunton, New Bedford, and other places. This schedule is as follows:

From 8 A.M. to 6 P.M., \$3.00; from 6 P.M. to 10 P.M., \$4.00; from 10 P.M. to 8 A.M., \$5.00.

For a second patient in the same family an extra charge of not less than \$1.00.

Consultation with another physician, \$5.00.

Advice given by telephone, \$1.00.

Ordinary visit at the office, \$2.00.

The above prices went into effect October 1. Some of the doctors have been charging these fees for some time and the adoption of the new schedule means that all the doctors will now charge the same fees.

## Correspondence.

### FARMING WITHOUT RUM IN 1829.

Cambridge, Mass., September, 1919.

Mr. Editor:—

It is likely that some of the "Old Americans" (as eugenist Papenoe terms them) at least, readers of your JOURNAL, will be interested in this pioneer practical prohibition document from the New Hampshire of ninety years ago. In these present years of the great educative prohibition experiment it seems worth the while thus to consider that the fight began earlier than some people realize. And farming is distressingly thirsty work.

This is the document:

### FOR THE SUPPRESSION OF THE USE OF ARDENT SPIRITS IN FARMING.

It is proposed to raise a fund for the purpose of excluding from farming the use of distilled spirits. The fund is to be distributed at the discretion of an awarding committee of the Hillsborough Agricultural Society to those who give satisfactory evidence at the next Cattle Show and Fair that they have done the labor of their farms through the season without the use of distilled spirits. The subscribers hereto agree to pay the sum annexed to their names to encourage and promote this desirable object.

(Subscribers may, if disposed, become competitors.)

(Signed)

Thomas Eaton  
Abner Pittee, Jr.  
Moses W. Eaton  
Titus Brown  
James W. Haseltine  
David Lewis  
John Gilson  
Charles Gullet

(Endorsement.)

October 1, 1829, the above paid over to the Treasurer of the Hillsborough Agricultural Society and by him paid out in premiums.

Dr. Thomas Eaton was sixth in the line from John Eaton who came over, probably from Wiltshire, Eng-

land, in the summer of 1639, and settled in Colchester, now Salisbury, Massachusetts. He was born in Hamstead, New Hampshire, Feb. 6, 1769. Dr. Cochrane in his "History of Franconstown, New Hampshire," page 662, writes of him in part as follows:—

"Dr. Eaton graduated at the Vermont Medical School and was in the practice of medicine eight years in Weare and Henniker, and thirty-two years in Franconstown. He succeeded his father upon the Eaton, or 'Richardson,' place, and became one of the most progressive, practical, and successful farmers in New England. His farm was for a number of years the 'premium farm' of the town, and the results of his methods of agriculture are still visible in the fields tilled under his supervision. He was, moreover, a large-hearted man, liberal with those in his employ, of the prosperity of many of whom he was virtually the founder. He also won a place in the history of American farming as the introducer of the Spanish Merino sheep into this country, and he was among the foremost to prohibit the free use of liquor upon the farm, and was the champion of the first temperance reform in the town, in which good work he antedated some of the best men of his time by fully a quarter of a century. He married..." etc. (He had five children, and today has numerous descendants, including great-great-grandchildren, up and down the Pacific Coast as well as in this vicinity. He himself lived eighty-nine years.)

Dr. Eaton kept a diary for about ten years while he was a medical student and during the early years of his practice in Franconstown and the surrounding just settling towns of Southern New Hampshire. This diary, begun in March, 1793, contains many curious facts and attitudes toward the science and art of medicine (as well as toward country life in general) a century and a quarter ago in New England.

The present annotator has Dr. Eaton's commission as Surgeon to the Twenty-sixth Regiment of New Hampshire Militia, signed by Governor John Taylor Gilman on December 20, 1798.

There must be much interesting medical biography more or less similar to this, stored away (and therefore virtually lost) in the home garrets of members of the ancient Massachusetts Medical Society. Why not, gentlemen, employ one of these relatively "healthy" afternoons, or even precious forenoons, in digging it out, editing the documents (it is a pleasant occupation), and sending them, either originals or copies, where they will be not only safe but useful? The "melting-pot" is a-boilin', and attics sometimes burn.

GEORGE VAN NESS DEARBORN.

## SOCIETY NOTICE.

THE NEW ENGLAND WOMEN'S MEDICAL SOCIETY will meet in the Boston University building, Boylston Street, corner of Exeter, on Thursday, October 16, at 8 P.M. This meeting will take the form of a memorial to Dr. Sarah Bond Frasier. Different aspects of her life and work will be presented by the following speakers: Dr. Anna Richardson, Dr. Hannah G. Myrick, Dr. Marian Nute, Dean Bertha M. Rood, and Mrs. A. W. Goodnow.

ALICE H. BIGELOW, M.D., Secretary.

## RECENT DEATHS.

DR. HERBERT GRANVILLE LESLIE died, following an operation for appendicitis, at Newburyport, September 1, 1919, at the age of 48.

He was a native of Amesbury and a graduate of Harvard Medical School in 1890. At the time of his death he was secretary of the Amesbury Board of Health and an active member of the Essex North District Medical Society. His widow, who was Miss Blanche Hardy, survives him.

# The Boston Medical and Surgical Journal

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### Address.

#### THE WORK OF RED CROSS ORGANIZATIONS IN RELATION TO THE PREVENTIVE MEDICINE OF THE FUTURE.\*

BY SIR ARTHUR NEWSHOLME, K.C.B., M.D.

It is difficult to give, as I am invited to do, in brief space and without the detailed reports of proceedings in which I took part, a clear conception of the conclusions reached at the extremely important International Conference of Red Cross Societies which was held in Cannes during April of this year.

I shall endeavor, however, to state the conception which gave rise to the conference and to give some of the conclusions reached by the experts in a number of departments of medicine on which are being based the initial steps for the organization of a new departure in Red Cross work.

It is unnecessary to remind actual Red Cross workers of the vast amount of beneficent work rendered possible by the gifts of possibly half the American population, which has been carried out by your agencies in the various belligerent countries. The record of saving life, of alleviation of suffering, and in other instances of prevention of greater suffering, is one calling

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for gratitude and congratulation. This work has been rendered possible by an unrivaled combination of trained and relatively untrained workers. The trained workers were indispensable; but without the invaluable assistance of intelligent, previously untrained, voluntary workers, a vast mass of suffering would have been left unalleviated and unrelieved.

This work in the main has been directed toward the healing of the sick and wounded, but not entirely so; for most interesting and valuable work has been done among the civilian population of the belligerent countries, in providing medical assistance, in special work for the treatment of tuberculosis, in securing medical assistance and advice for mothers and their children, and in caring for those who have been rendered homeless by ruthless war. In America, also, Dr. Clark informs me that around military camps in States in which public health administration is imperfect, an organization has been evolved, through cooperation between the Central Public Health Service and the American Red Cross, by means of which territories about camps have been "cleaned up," the risks of malaria and other communicable diseases, including venereal diseases, have been minimized, a good milk supply assured, and elementary sanitation established. It is evident, therefore, that already the

\* An address delivered at American Red Cross Headquarters, Washington, D. C., May 2, 1919.

Red Cross, when local sanitary arrangements were imperfect or in abeyance, has taken upon itself the burden of the emergency preventive measures as well as of measures of relief.

In so doing it has acted wisely. Preventive work is always more productive in results than relief work. It is also more economical. It is wiser as well as more humane to erect a parapet along the top of a dangerous cliff than to provide an ambulance at its base.

I do not wish, however, to give countenance to the notion that prevention and treatment of disease must be regarded as antitheses. The two are parts of a whole and not distinct and separate. This may be illustrated by two of the most serious diseases to which humanity is subject, tuberculosis and syphilis. Of these, tuberculosis is probably the chief producer of dependent widows and orphans; while syphilis, on the authority of Sir William Osler, must be regarded as third among the killing diseases. For the prevention of both of these diseases treatment forms an indispensable preventive measure. Every arrangement conducing to the comfort or recovery of the tuberculosis patient diminishes the risk of massive infection in his family; and the prompt treatment of syphilis by arseno-benzol preparations is the most effective means for securing his immediate disinfection as well as his progress toward cure. And even when the elementary personal infection is absent, it can be argued with justice that the prompt and efficient medical treatment and nursing of the sick not only diminishes the duration of individual disability, but prevents the impoverishment and enfeeblement of other members of the same family.

But for an increasing proportion of the total sickness of humanity, total prevention is now possible, and I need scarcely cite the almost complete disappearance of typhus in western nations in peace time, the rapid decline of enteric fever, and the improvement in regard to a large number of other diseases. The number of preventible diseases is being steadily increased, as investigation progresses, and as our knowledge of the already ascertained laws of health increases and becomes disseminated among the general population.

It was, therefore, a happy inspiration of Mr. Davison, the President of the American Red Cross, which led to his calling together the international conference of Red Cross Societies

at Cannes, with a view to considering means by which the worldwide activities of Red Cross workers might be utilized for the prevention of illness as well as for the treatment of sick and wounded mankind. It is a vision of the future which, I think, will have a great influence on the welfare of mankind, if—as I am confident will be the case—the conception fires the souls of the multitude of Red Cross workers and contributors in every civilized country, and leads them to determine against demobilization of their forces, and to continue their beneficent activities against the horrors of peace, which, in the aggregate, are even more serious to mankind than those of war.

The statement that the devastations produced by disease in times of peace are even greater than the loss of life from war may be illustrated by the experience of England and Wales. In the four years, 1911-14, immediately preceding the World War, 2,036,466 persons died in England and Wales, while, according to official figures, the total loss of men during the 4½ years of war, was 535,743, including 161,800 presumed dead. The war figures give the entire loss for the British Empire; but it cannot be far from the truth to state that war on the gigantic scale of the war from which we have just emerged has killed in Great Britain about one-third as many as have died in the civilian population in a corresponding period. I do not lose sight of the fact that a large proportion of the civilian deaths occur in ripe old age, and that 28% of the total civilian deaths occur among children under five, while those destroyed by war are adults and the most virile of our race. But the greater part of the deaths in childhood, as well as in adult life, before old age is reached, are preventible; and in the future will be prevented, given adequate research, intelligent and unsparing application of knowledge already in our possession, and an avoidance of the public parsimony which, in relation to public health, constitutes the most serious form of extravagance. That is the idea which Mr. Davison and his collaborators place before us; and it was to devise plans to this end and to enlist the continued coöperation of all Red Cross workers that the conference was called at Cannes.

The conference held a number of general meetings in which the general policy to be pursued was discussed and then divided itself into

sections dealing with the following subjects: preventive medicine, child welfare, tuberculosis, malaria, venereal diseases, nursing, information and statistics. These sections were not selected as covering the entire group of preventive medicine, but as forming branches of work in which early investigation and action appeared to be most desirable.

But first of all the lines of general policy were discussed:

It is evident that although measures for the prevention of disease constitute a definite governmental function—neglect of which is treason to the communal welfare—even in the more advanced countries our governing bodies have not lived up to their potentialities. In scarcely a single sphere of its work can it be said of any government or of any local authority, that what could be done to prevent disease and to avoid human suffering has been completely accomplished. To say this is merely to express the imperfections of humanity singly, or the greater imperfections of Committees of Councils entrusted with the public purse and the public weal.

There is, and I think always will be, ample scope for supplementation of official work by voluntary workers, for the experimentation in new and promising work which it is so difficult to initiate in official circles, and for the undertaking of necessary work by devoted volunteers when public opinion and officialdom refuse to undertake it.

This disposes of the argument that Red Cross activities in the prevention of disease merely prevent the development of official work. The true object of all voluntary workers is to stimulate official public health work, and when in any sphere the latter is fully developed to welcome the disappearance or reduction of voluntary non-official work, or seek the new means of social help which are always waiting for devoted workers to initiate.

The conference agreed that the new work of the Red Cross would naturally divide itself into two parts: an International Bureau, and National Organizations. The duty of these and their relation to each other will be more clearly seen in the light of experience. The International Bureau in the scheme proposed for the consideration of the conference—which received general approval—would act as a great centre for collecting information on various public

health subjects, and for digesting it and subsequently distributing it by means of special publications, or periodical journals, or on application from those requiring specialized information. It would also act as a means of educating the general public on urgent problems affecting its welfare; and it would be utilized as a centre, organizing in less favored communities, missions which would undertake local investigations and remedial work. These surveys and activities would be intended rather as demonstration centres than as permanent organizations, the intention being to withdraw them as soon as the necessary work could be carried on by local Red Cross or other organizations.

It was suggested that the central bureau should comprise a number of branches dealing with epidemic diseases, tuberculosis, venereal diseases, child welfare, nursing, and other subjects, collating and analyzing information and distributing it through the medium of the National Red Cross of each country.

Such a central bureau, it will, I think, be agreed, will be of the greatest value to all social and public health workers, while not clashing with any existing agency.

The proposed organization of Red Cross agencies for preventive work has already received an imprimatur in the draft league of peace; and it would be appropriate that its headquarters should be near if not side by side with the future home of that league. If it receives the full development for which we hope, it will form, perhaps, a chief instrument in securing peace and continued happiness for mankind.

The relation of the central bureau to National Red Cross societies will be one of mutual coöperation. The central bureau will provide information and facilities for national work; the actual work will need to be carried out in each country nationally and in the main from funds supplied by that country.

It is not intended that the National Red Cross shall undertake, much less compete with, work already being carried out either by local authorities or by existing voluntary associations. If, for instance, there is a society concerning itself with child-welfare, or the prevention of tuberculosis, or of venereal diseases, the National Red Cross would naturally give such assistance as it could through its voluntary workers in the special work, while leaving untouched existing arrangements. If no such

societies existed the National Red Cross might advantageously assist in their formation, retiring as soon as the separate organization was working.

In countries in which official and existent voluntary agencies scarcely exist, more active and continued direct work of the Red Cross organization will be called for; in such countries assistance may be needed from the central international bureau.

Evidently there are many points of central and national administration requiring and now receiving fuller and more detailed consideration; and all that need now be said is that it appears to me certain that International and National Red Cross organizations which will concern themselves with the prevention of disease as well as with the relief of suffering will be formed, and that they will have pregnant influence in hastening the reduction of human disease.

The second week's deliberation of the conference at Cannes was filled with meetings of Committees of experts and more formal sectional meetings, at which lines of policy on certain specific subjects were formulated for the later deliberations of Red Cross Societies in Geneva.

It is unnecessary to summarize in detail the scientific recommendations reached in various subjects. It may suffice, as indicating the wide scope of the field of work about to be surveyed, that among the more urgent problems of preventive medicine priority was given to advocacy of combined efforts for the prevention of the major pests of mankind, of the provision of laboratory assistance in the diagnosis of disease, and in securing more accurate vital statistics and improvements in public health legislation.

In child welfare work, the importance of health visiting, of child welfare centres, of an improved midwifery service, and of continuous observation of children under school age as well as scholars was emphasized.

In regard to tuberculosis, stress was laid on the essential point that measures against this disease must embrace the whole of the sick lifetime of the patient, and must include, when necessary, measures for obviating the results arising from the fact that the partially recovered patient commonly is unable to earn an economic wage.

In the prevention of venereal diseases a similarly wide outlook was advocated, including the

necessary social and moral as well as medical measures against their spread.

In the preceding brief statement I have endeavored to indicate the main outlines of the proposals considered by the Cannes-Conference. My statements are merely those of a participant in the Conference; and it is evident that outside of the momentous decision to endeavor to retain mobilized the forces of Red Cross organizations, and to secure their assistance in the great impending struggle against disease, no final decisions have been made. The growth of the central and of each National organization in the desired direction must necessarily occupy time, though I believe development will be rapid once the great ideal is visualized clearly by Red Cross workers in each country.

I have referred in an earlier part of these remarks to the imperfections of governments, central and local, in the control of disease. These imperfections indicate one of the most promising fields in which voluntary agencies, like the Red Cross, can assist toward greater efficiency. Both local and central authorities are elected by the people themselves and the laws and regulations for the promotion of the public health—and what is even more important, the enforcement of existing regulations—depend for their efficiency on public opinion, which we can all assist in forming. The natural tendency on the part of the social enthusiast who has been disappointed in his efforts at reform is either to retire from the fight or to organize a voluntary organization having the same end in view. This last may sometimes be the best line to pursue, though in that case endeavor should be made to secure friendly relationship with, if not also the active coöperation of the local authority. But often the most hopeful plan is to fight the local elections and to secure the election on local governing bodies of men and women who will give these bodies no peace until the necessary reforms are secured.

If we are to be helpful we must be kindly and charitable in our criticism of local authorities. Nothing has made it so difficult to secure good men and women to undertake the burden of local government as the indiscriminating and uncharitable criticism aimed at those engaged in it. Criticism of members of our central and local governing bodies is not seldom deserved; but critics are too often those who will give no assistance in the work which, with insufficient



knowledge, they villify. When we hear of scandals in administration, let us have a sense of proportion, remembering the grosser corruption evidenced, for instance, in Pepys' Diary, and especially remembering that the best way to remove corruption is by ourselves taking a part in the work of central or local government, or by steadily upholding those who are doing so with integrity.

The onlooker, whether it be on voluntary or on official work for the commercial good, has his duty to perform as well as the worker. It is his duty to make himself acquainted with local conditions and with local administration, even though he takes no part in it. A chief need at the present time is an interested study by every adult of all the phases of local administration in each district; and in my view Red Cross organizations will be rendering inestimable service to the community if they succeed in educating the public conscience to this effect. Increased local patriotism is urgently needed if the prospective fight against disease by the Red Cross Societies is to succeed, and if the further triumphs of preventive medicine within our reach are to be secured. To this end enthusiasm will need to be infused into official public health administration as well as into the work of voluntary agencies; and it is only by developing all the possibilities of our governing bodies as well as of voluntary societies and by securing the closest coöperation between the two that the new ideal of the Red Cross organization can be realized.

### Original Articles.

#### THE TREATMENT OF CARCINOMA OF THE SKIN WITH RADIUM. THE RESULTS IN THE CASES TREATED AT THE COLLIS P. HUNTINGTON MEMORIAL HOSPITAL.

COMPILED BY CHANNING C. SIMMONS, M.D., BOSTON.  
[From the Cancer Commission of Harvard University.]

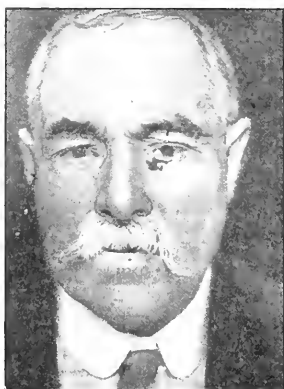
THE following is an analysis of the cases of carcinoma of the skin that have applied for treatment at the Collis P. Huntington Hospital from 1912 to 1916, inclusive. There were 259 cases diagnosed clinically as rodent ulcer, epithelioma, epidermoid carcinoma, or carcinoma, the actual term employed depending more on the individual making the diagnosis than on the type of cell forming the tumor. At

one time an attempt was made to remove a specimen for pathological examination from every case, but this was found impracticable as a routine and was abandoned; consequently the diagnosis is clinical in the greater number of the cases. We have pathological reports on 51 cases, however, and have been struck by the fact that a number of cases diagnosed clinically as being of the basal cell type proved microscopically to be prickle cell carcinoma.

The policy of the hospital has been not to use radium in all cases of malignant disease applying for treatment but to advise operation if it seems best in a given case. Patients referred to the hospital are considered as being seen in consultation and advice is given; or, if they are suitable cases, they are accepted for radium treatment. In certain of the milder cases in which the growth is favorably situated, operation gives a better immediate result and a greater hope of permanent cure. In another class of advanced cases operation, to remove the greater portion of the growth, followed by radium treatment, is the treatment of choice. Much can be accomplished by this method in advanced carcinoma of the cheek, for example, in which the upper jaw and orbit are extensively involved. Life is prolonged and the wound made clean even if the disease cannot be completely eradicated. Most of the cases referred to the hospital are suitable for radium treatment and can be divided roughly into two classes,—those in which a permanent cure is to be expected and those in which the disease is extensive and in which radium is used as a palliative measure to retard the rate of growth.

Radium is particularly valuable in the treatment of skin cancer arising about the orbit. Less deformity of the lids results by the destruction of the growth in this manner than by operation, which can always be performed later if the radium treatment is unsuccessful. Operation, in many instances, implies loss of sight of the eye by reason of destruction of the lids and later infection, or the position of the growth makes enucleation necessary. In carcinoma of the foregoing region, as well as on the nose and parts of the cheek, the final cosmetic results following radium treatment are better than those following operation. (Cases 1 and 2.) On the other hand, in some cases, especially where the growth is situated about the ear or on the cheek, operation, followed by a plastic flap or skin graft, gives a better result.

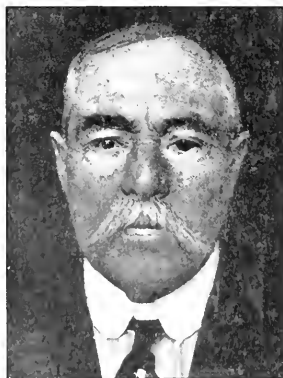
CASE 1. Hospital number, 15,85; male, 71; February 25, 1915. Three years ago tumor on left lower eyelid appeared. Two years ago consulted physician and was given x-ray treatment every two weeks, and these were continued for



CASE 1.—Showing lesion below left eye.

two years, but the growth, although benefited at first, still persists. Examination shows a large indurated area involving the entire left lower lid. Marked conjunctivitis.

Patient received two treatments with radium in May followed by considerable reaction. Further treatment given in June. August, 1915, growth was apparently entirely destroyed. Lit-



CASE 1.—Showing scar of former lesion on left lower eyelid.

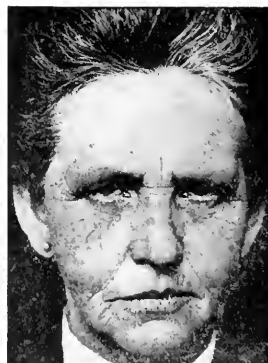
tle deformity of lower lid. In September, 1916, small recurrence. One treatment with radium. One month later this had disappeared. In January, 1916, evidence of recurrence in the scar and radium treatment given. There were other

slight recurrences in October, 1916, and February, 1917, both of which were treated with radium. The last treatment was in June, 1917. In May, 1918, no evidence of recurrence. Slight deformity of lower lid.



CASE 2.—Showing rounded growth on lower lid which is drawn downward by the tumor.

CASE 2. Hospital number, 14,110; April 28, 1914; female; aged, 56. Fifteen years previously small wart appeared on right lower lid. Removed it at this time herself. Three years ago wart recurred. Treated with carbolic acid. No other treatment. Examination shows on the lower lid of right eye rounded mass 1 cm. in diameter (see photograph). Some ectropion.



CASE 2.—Showing disappearance of tumor.

Microscopical examination, small specimen removed. Epidermoid carcinoma.

Patient received two treatments of radium on May 2 and May 5 of 18 and 14 millicuries, steel needle, unscreened. Latter treatment of three

hours. Some slight reaction following the treatment. Six weeks later the growth had entirely disappeared, and the resulting ulcer healed. Four years later no evidence of recurrence.

A plastic operation can also be performed for ectropion or deformity of the nose after the destruction of the growth by radium, but should not be attempted until all inflammatory reaction from the radium has subsided and sufficient time has elapsed to make the possibility of recurrence remote (Case 3). Carcinoma arising on the tip of the ear responds very slowly to radium and operation is usually the treatment of choice, the resulting deformity being less noticeable than would be expected.

CASE 3. Hospital number, 1411; male, 62. January 12, 1914. Fourteen years ago received



CASE 3.—Showing method of application to persistent tender portion of the edge, protecting new-formed skin.

a blow on the right side of the face. One year later small sore appeared there, which was curetted. This only partially healed. Three



CASE 3.—Appearance of growth before treatment.

years later sore excised and then remained well for five years. Two years ago it broke down again, and was removed, but did not heal. Dur-

ing the past summer has received several x-ray treatments without improvement.

Examination shows extending from the inner canthus right eye to malar bone an elliptical ulcerating area  $5 \times 1\frac{1}{2}$  cm in diameter. The borders and base are typical in appearance of epidermoid carcinoma.



CASE 3.—Showing condition of scar at inner canthus of right eye.

Pathological report of small section of growth removed for examination,—suspicious of carcinoma.

In January, February, March, and April, patient received eleven radium treatments with marked improvement. Growth slowly closed over, and July, 1914, tumor had been entirely destroyed. There was marked ectropion of lid and opening into the antrum. In March, 1915, there being no evidence of recurrence, plastic operation was performed at the inner canthus. February 15, 1918, no evidence of recurrence.

All patients should be warned of the possible depilatory effects of the radium, as the beard, eyebrows, or eyelashes may be unavoidably destroyed. Treatment inside the buccal cavity even will often destroy the beard. In treating carcinoma in the region of the orbit, they should also be warned of the probability of conjunctivitis. A Wassermann test should be taken in all cases in which there is the slightest suspicion of syphilis, as the clinical diagnosis between rodent ulcer and syphilis is at times difficult. It must not be forgotten, however, that carcinoma can arise in a syphilitic ulcer, or that the two conditions may be co-existent and have no relation to each other.

We have made it a rule not to treat carcinoma of the lip with radium except in cases where

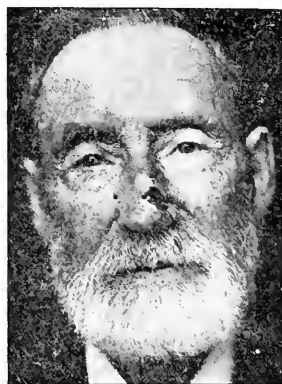
operation is contraindicated on account of diabetes, high blood pressure, or the extent of the growth, as we consider operation the only proper treatment. We have seen cases in which a small carcinoma of the lip had been entirely destroyed by radium develop hopeless carcinoma in the glands of the neck a few months later. Keratosis of the lip, the precancerous condition, yields readily to radium, which is the treatment of choice.

*Methods of Treatment.* The actual method of applying the radium for treatment varied greatly as to the type, situation, and extent of the growth. The usual procedure in the small superficial tumors in accessible regions was to fasten the glass tube containing the emanation, which was in turn enclosed in a steel needle, to the top of a metal cone 1 cm. in height, the diameter of which was slightly larger than the growth. The cone has a broad flange on the bottom which protects the surrounding skin from the action of the rays. The cone with the radium attached was then fastened over the growth and allowed to remain in place for from one-half to two hours. The usual dose was from 20 to 50 millicuries, although heavier treatments have recently been used. In growths about the scalp or orbit, sheet lead was also used as a protection to prevent loss of hair or conjunctivitis, which, in spite of all precautions, often follows the treatment of carcinoma of the lids. The average small growth usually disappeared in from two to four treatments, often in one, but the resulting superficial ulcer heals slowly. After the first treatment, patients report once in two weeks for observation and further treatment, as necessary. We have found that the best method of treating the superficial ulcers is to instruct the patient to bathe them once or twice daily with a solution of peroxide and water, equal parts, and keep them covered with white vaseline or other bland ointment, on a piece of compress cloth. (Case 4.)

CASE 4. Hospital number, 16,198. May 16, 1916: male, 86. Present growth appeared on the nose about two years ago. Plaster applied at that time without improvement. One year ago x-ray treatment, with slight temporary improvement. Examination: Shallow, irregular ulceration 1 x 2 cm. in diameter on the left side of the nose. (See photograph.)

Patient received four treatments with radium during May and June. Six weeks after first

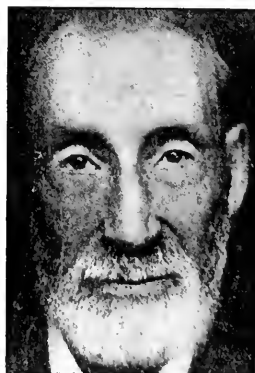
treatment ulceration was entirely healed. June, 1918, two years from first radium treatment, no evidence of recurrence.



CASE 4.—Showing epidermoid carcinoma of nose.

In the large superficial growths the steel needles containing the radium emanation were usually laid directly on the growth in a series around it a short distance inside the edge. The bare glass tubes are also, at times, used in a similar manner, or raised up  $\frac{1}{2}$  cm. from the surface on a piece of gauze.

Fungoid growths, where there was considerable tumor tissue, were often treated by imbedding the glass tube containing the emanation directly in the tumor and leaving it *in situ*. One or more tubes containing from 5 to 12



CASE 4.—Showing former lesion entirely healed.

millicuries were usually embedded in this manner.

Emanations in a small glass sphere were at

times used in treating growths on the eyelids.

In large growths on the cheek which have involved the bone and infiltrated the antrum much may be accomplished by removing the tumor by operation with the knife, curette, and actual cautery. A tube of radium may be introduced into the cavity thus formed in the gauze packing at the time of operation and left in place for from 12 to 48 hours, depending on the amount used. The deformity following these operations on the upper jaw is surprisingly little, considering their extent. Further radium treatments are given as indicated. The same procedure may be followed after eventration of the orbit for cancer, or, if there is a chance of all the growth having been removed, the radium treatment may be delayed until a recurrence appears.

All cases are requested to report at the hospital regularly for observation whether they need treatment or not. Cases which do not report are followed up at the end of six to twelve months from their last visit to determine their condition.

The 259 cases, for convenience of study, were divided into the following groups: Cancer of eyelids and about the orbit, 52 cases; cancer of the nose, 79 cases; cancer of the cheek, 71 cases; cancer of the forehead, 27 cases; cancer about the ear, 24 cases; miscellaneous cancer (hands, feet, etc.), 6 cases.

Of these cases 201 (77%) had previously received some form of treatment. In some the growth had been destroyed but had recurred, while in others treatment had had little or no effect. Many patients had drifted from one physician to another and had tried several different remedies. Many of the methods of treatment employed are well recognized and it must be borne in mind that we only saw the unsuccessful cases and have no means of judging the numbers cured. A list of the more common methods employed is given below.

X-ray .....	61 cases
Violet light .....	4 "
Finsen light .....	1 "
Radium .....	11 "
Electricity .....	3 "
Operation .....	67 "
Cautery .....	13 "
Freezing (liquid air, etc.) .....	6 "
Cancer pastes .....	27 "
Ointments .....	44 "
Treated by many remedies .....	49 "
No previous treatment .....	56 "
No data .....	2 "

The cases received treatment at the hospital as follows:

Treated with radium .....	201 cases
Treated by operation .....	28 "
Treated with x-ray .....	4 "
No treatment .....	26 "

CASE 5. Hospital number, 15,163; May 25, 1915; female; aged, 77. Twenty years ago, following a bruise on the nose, a wart appeared.



CASE 5.—Showing carcinoma basocellulare of nose.

which patient says she used to cut with knife. One year ago, following irritation, growth increased. Consulted local doctor, who gave her an ointment. This had no effect on the wart, which gradually increased in size to the present



CASE 5.—Showing marked improvement since radiation.

time. Examination shows nose occupied by a mass of hard ulcerating new growth, 4 x 5 cm. in diameter (see photograph).

Pathological report of specimen removed for examination: Epidermoid carcinoma.

During June, July, and August, patient received 17 treatments with radium. Most of these, however, were small and were applied in



CASE 5.—Showing extension of carcinomatous area over face, involving the entire nose, upper lip, greater portion of cheeks and eyelids.

steel needle, without screening, to various portions of the growth. By September, 1915, condition was very much improved (see photograph). Had two heavy treatments in October and November, 1915, but during this time the growth rapidly increased in size and continued to spread, involving the nose, cheeks, and antrum. Patient died June 28, 1916.

**Radium Treatment.** Of the 201 cases treated with radium, 171 were cases in which complete destruction of the tumor and healing of the ulcer were to be expected, in other words, a "cure," although we avoid this term in speaking of carcinoma. A certain number of cases, clinically indistinguishable, proved to be very resistant to the radium, and the tumor, although destroyed in some parts, tended to extend at the periphery in spite of heavy treatments (Case 5). Of the other 30 cases treated with radium complete destruction of the tumor was not to be expected. In 15 the disease was so advanced radium was used only as a palliative measure, and, in the other 15 cases an insufficient amount of radium was used to accomplish any result, as the patients failed to report regularly for treatment. In 124 of these 171 cases, or 72.5%, the growth was destroyed and the ulcer healed; in other words, an "immediate cure" was obtained. In 36, or 21%, no benefit was noted following treatment, and in 11, or

6.5%, there was only temporary improvement. Five of the cases in this last group were later operated upon.

TABLE I. IMMEDIATE RESULTS, RADIUM TREATMENT.

"Immediate cure" .....	124 cases	72.5%
No improvement .....	36 "	21.0%
Slight improvement .....	11 "	6.5%
Insufficient treatment .....	15 "	
Too advanced for much relief ...	15 "	

No reason could be found for the lack of response to treatment in the 36 cases in which no improvement occurred. There was no relation to the age, sex, or position of the growth. In some cases the growth was extensive, but no larger than in others which yielded readily to radium. The type of cancer made little difference in the cases in which a specimen was available for study, although cancer diagnosed microscopically as being of the basal cell variety was slightly more favorably influenced by radium than the prickle cell type.

TABLE II.

	EPIDERMOID OR SQUAMOUS CELL CANCER	BASAL CELL CANCER OR CARCINOMA	PAPILLARY CANCER	ADENOCARCINOMA
Immediate cure .....	6	9	2	1
Slight improvement ..	2	2	0	0
No improvement .....	11	21	0	0

Some of the growths which did not yield readily to radium were small, and while there would be slight improvement in the center of the ulcer following treatment, the process would extend at the periphery despite heavy doses.

**Remote Results.** Of the 124 cases in which an immediate cure was effected by radium, 121 have been kept under observation for one or more years. Twenty-five cases, or 20.1%, have recurred. On the other hand, the recurrence was small and in 13 disappeared after one or two light radium treatments. The recurrences usually appeared about the periphery of the scar (Case 6).

CASE 6. Hospital number, 14,133: male, 74; May 25, 1914. Warty growth on the nose near the inner canthus appeared 15 years ago. Fourteen years ago consulted physician, but advised no treatment. One year ago x-ray treatment advised. Has received x-ray and radium treatment for past two years: amount of radium not known.

Examination shows the inner canthus of the

right eye ulcerated, area 1 x 1 cm. in diameter; base soft, edges raised and indurated. Considerable conjunctivitis.

Patient received one treatment of 16 milligrams of radium for one hour; no screening. Six weeks later lesion entirely healed. Scar soft. During the next three years patient came to the hospital several times for treatment of small keratoses on portions of the face, which yielded readily to radium treatment. In June, 1918, there was no evidence of recurrence of growth at the inner canthus or on the cheeks.

TABLE III. END-RESULTS.

No recurrence 1 year .....	8 cases	
No recurrence 2 years .....	14 cases	
No recurrence 3 years .....	51 cases	
No recurrence 4 years .....	22 cases	
Recurrent cases .....	26 cases	21.4%
Result unknown .....	3 cases	

(Of the 26 recurrent cases, 13 yielded readily to further light treatment.)

It may be stated, therefore, that in carcinoma of the skin suitable for radium treatment in 72.5% of the cases an immediate cure is to be



CASE 6.—Showing ulceration of inner canthus of right eye. The central necrotic portion is probably due to the radium application.

expected and of these 90% will remain free from the disease or if a recurrence does take place, it will yield readily to further light treatment. We consider, however, that in cases of epidermoid carcinoma in which the growth can be removed easily without marked resulting deformity, or cases in which metastases are likely to occur, operation is the treatment of choice.

*Results of Operative Treatment.* Of the 28 cases treated by operation, 26 were alive and free from recurrence one or more years later. Ten of these cases were of carcinoma about the

orbit so extensive that removal of the orbital contents, together with the lids, was considered



CASE 6.—Showing scar tissue replacing rodent ulcer at inner canthus of right eye.

advisable. Nine of these cases are still free from recurrence. Five of the cases were operated upon as radium failed to destroy the disease.

#### LOSS OF SIGHT FROM RETROBULAR NEURITIS DUE TO POSTERIOR ACCESSORY SINUS DISEASE, WITH REPORT OF 17 CASES.\*

By LEON E. WHITE, M.D., BOSTON.

AFTER reading Shuter's masterly book, "Headaches and Eye Disorders of Nasal Origin," one hesitates to enter this field. I believe, however, the subject well warrants further elucidation; for in spite of the brilliant writings of Onodi, Loeb, Knapp, Holmes, deSchweinitz, Posey, Hajek, Birch-Hirschfeld, Killian, deKleyn, Berger, van der Hoeve, Halstead, Stark and many others, the subject has not, I think, been sufficiently comprehended. The cases are so rare that one seldom sees enough of them to know what to expect. The usual opinion seems to be that the seat of the trouble is determinable on a casual nasal examination. Pus, polypoid tissue or caries was formerly looked for, but now we recognize the importance also of a thickened or hypertrophied membrane—hyperplasia, as it is designated. Vail defines this as a "rarefying osteitis associated with inflammatory swelling and fibrous thickening of

\* Read before the American Laryngological, Rhinological and Otolological Society at New York City, on June 6, 1919.

the mucous membrane lining the accessory sinuses. It is brought about, according to Delafield and Prudden, by long continual hyperemia. Examination of the nose is negative where the hyperplasia does not involve the middle turbinate. It is especially to this type of case that I wish to call attention.

The more one studies the structures surrounding the sphenoidal sinuses, the more one is impressed with the importance of a thorough comprehension of the pathological conditions found here. These sinuses vary greatly in size and position, even in the same individual. They may extend outward and backward into the greater wings of the sphenoid to the Gasserian ganglion and have a capacity of 12 cubic centimeters or more. The pituitary body, chiasma and optic nerve are in relation to the superior wall, while externally lie the optic, abducens, oculomotor, trochlear, ophthalmic and maxillary nerves, the cavernous sinus, the internal carotid artery, and the dura of the middle fossa. "In some specimens," Killian says, "the blood circulating in the cavernous sinus bathes the whole roof as well as the lateral walls." Bearing these relationships in mind one can readily see what effect an inflammatory process here might have on these structures. Cases of brain abscess and cavernous sinus thrombosis from sphenoidal sinus disease do occur, but fortunately are rather rare complications, while the affection of the adjacent nerves, such as impairment of vision and intense neuralgia, are only too frequent.

As to the vulnerability of the optic nerve much research work has been done. For instance, Francis and Gibson made a study of sixty specimens, in one-third of which the optic nerve was separated from the sphenoidal sinus by a paper thickness of bone measuring less than 1/100 of an inch. This frailness was well demonstrated when I was removing the lining of a sphenoidal sinus in the dissecting room recently. This bone, in a comparatively fresh subject, was so fragile that it came away with the lining, thus exposing a considerable area of dura. It is difficult to conceive how an inflammatory process could go on in a sinus of this type without causing serious damage. The wonder is that so few complications arise.

deKleyn and Gerlach made a study of the optic nerve in a case of old sphenoidal sinus disease, and found circumscribed infiltration

opposite the sinus. The same capsular diplococci were found in this infiltrate as in the mucosa of the sinus.

As to the cerebral complications from sphenoidal sinusitis, I have seen but one case, but in 1905 Dr. St. Clair Thompson gave a brief history and autopsy findings in 42, all but 2 of which were collected from previously reported cases. Most of these ran a very rapid course (as illustrated by my case), and while the findings as to the eyes were meager, they were most interesting as showing the effect on the optic nerve of disease in the sphenoid.

CASE 38 of the series is as follows:

"Male, 78: two and one-half years before death eyesight became suddenly impaired and subsequently totally lost from double optic neuritis and post-neuritic atrophy."

The autopsy showed complete destruction of the walls of the sphenoid.

In *twelve* of the *forty* cases loss of vision with or without changes in the fundi are mentioned, thus:

In CASE 1. Sudden blindness in right eye. Optic disc cloudy.

CASE 8. Diminution of vision on one side.

CASE 15. Three weeks before admission, failing eyesight was noted.

CASE 16. Congested optic discs.

CASE 17. (Reported in full, it being Dr. Thompson's own case). Had complained that everything was misty before him. Both optic discs were slightly hazy.

CASE 21. (Also Dr. Thompson's patient.) Had double optic neuritis.

CASE 24. Complained of dim sight five days before admission to hospital.

CASE 25. Had pain in left eye with failing of sight 2 days later "as from mist before the eye." Complete blindness followed. The fundus showed dilated veins and edema of papilla. Five days later the right eye was similarly affected.

CASE 27. Gave a history of pain in the left eye and diminished vision on that side.

CASE 33. Had scotoma and diminished vision in both eyes.

CASE 35. Had diminished vision ending in complete blindness.

CASE 36. Had unilateral loss of vision.

In 1900 Miller reported two fatal cases from sphenoidal sinus disease, preceded by sudden and complete loss of vision.



Dr. D. W. Greene reported a fatal case of unrecognized empyema of the right sphenoidal sinus, with loss of vision in the right eye. On autopsy "the blood vessels (veins in particular) occupying the floor of the right anterior and middle cerebral fossae were engorged with blood; the overlying dura was boggy and opaque and the anterior clinoid processes, together with the superior wall or roof of the right sphenoid, were of a grayish red color, almost black in places, and necrotic. The right ophthalmic vein and artery, the right optic nerve and other minor structures occupying this position about the right clinoid process, were agglutinated and embedded in a mass of inflammatory lymph."

Chisholm in 1882 reported two instructive cases of blindness from malignant growth in the sphenoid. In the one,—a boy of seven—almost complete loss of sight came on within two weeks in the right eye and some loss of vision in the left. There was pallor of both discs. A year later the boy was totally blind in both eyes and both discs were white. In the other case,—a physician—loss of vision came on in the right eye several months after the pain started in that side of the head. The disc was pale. Left eye had normal vision at first examination but five months later it was so poor that he could see only the outline of large objects. Both discs were white.

Dombrowski also has reported an interesting case of retrobulbar neuritis caused by carcinoma of the sphenoid. At first there was slight blanching of the disc and restriction of the visual field in one eye. Later complete loss of vision in one eye with optic atrophy and commencing loss of vision in the other.

The case of Wood and Wallis is instructive as it shows the difficulty in differentiating cases of retrobulbar type from those where the optic neuritis is of cerebral origin. Their patient had defective sight for two years in the left eye with vision for hand movements and the right was also somewhat affected. Vision 6/9 with marked papilloedema. There was pus in the nose. The removal of the middle turbinates and opening of the sphenoids brought about normal vision right and nearly normal left.

The writers up to ten or twelve years ago laid great stress on the intimate relation of the optic nerve to the accessory sinuses, and seemed to feel that pressure was the all important factor. The literature showing the growing comprehen-

sion of toxæmia and hyperplasia is most interesting.

Krauss was one of the first to express the toxæmic view. He said in 1909 that "retrobulbar neuritis is generally supposed to be due to an extension of the inflammation from the sinuses to the optic nerve, but the rapidity with which the retrobulbar neuritis disappears after the evacuation of the pus from the opened sinuses is often a source of surprise and would indicate that the neuritis was due rather to a local toxæmia than to an inflammatory process. It is readily conceivable that, soon after the supply of toxins through the lymphatics to the nerve fibres ceases, the natural recuperative forces are set to work. Another reason for the supposition that we have toxæmia to deal with is that the macular fibres are selected for specific action by the inflammation." He cites the case of a patient who had pain in the right eye accompanied by very dim sight and a constantly present black spot. There was faint haziness of the retina and contraction of the visual fields. There was an extreme deviation of the septum to the right, and pus was found about the middle turbinate. A rapid cure was effected by resection of the septum and the opening of the ethmoid cells.

Teillais, in 1908, reported a unique case where toxæmia seemed to play the leading rôle. The extraction of the molar tooth was followed by an acute infection of the left maxillary antrum and orbital cellulitis which spread to the neighboring sinuses, causing blindness and optic atrophy of the left eye and neuroretinitis of the right.

Stevens reported the case of a woman in middle life where the toxæmia was so great as to cause stupor, slow pulse, subnormal temperature and headaches in addition to the more frequent symptoms of failing vision and moderate optic neuritis with central scotoma, vision 4/20 each eye; history of nasal discharge suddenly stopping before onset of symptoms. Recovery followed the opening of the posterior ethmoid and sphenoid.

In 1910 MacWhinnie says that because of the fact that in several of his cases the probing of the sphenoid immediately increased the fundus congestion, he was led to believe that these cases were really the result of absorption of toxic products from this sinus through the lymphatics, although "I am well aware," he says,

"that, so far, there has not been any established relation between the lymphatics of the eye and the sinus other than the very noticeable widening of the perivascular lymph channels in the axial strand, demonstrated first by Schieck pathologically." MacWhinnie reported five cases giving peri-metric charts before and after operation. "Personally," he writes, "I believe it is good practice to open the sphenoid in cases of optic neuritis or choked disc, showing para-central scotomata in the visual fields, no possible harm being done if there is not an involvement of the sinus, and if it is present we have eradicated one of its etiological factors."

Gradle's views as to the etiology of blindness and the blind spot from accessory sinus disease differ considerably from previous writers. After giving the anatomical relations and blood supply of the optic nerve, in accordance with the teachings of Onidi, Loeb, Vossius, and Gray, he says:

"These anatomic facts explain the course of disease from the accessory sinuses to the optic nerve. The infection, the edema, or whatever may be the disturbing factor, passes from the sinus periosteum through the diploic veins and lymph channels to the orbital periosteum, thence by continuity to the intracanalicular portion of the dura of the optic nerve, or possibly through the periosteal veins or dural veins directly to the central vein of Vossius. If the dura alone is involved, thus causing a pressure upon the periphery of the optic nerve within the canal, the peripapillary bundles alone will be involved and an enlargement of the blind spot will result. If the process extends further and involves the central vein of Vossius, surrounding it by an edema, the neighboring nerve bundles will suffer. These happen to be the papillo-macular bundles and there results a central scotoma. Consequently, I believe that I am justified in stating" (contrary to the teachings of Onidi and Loeb) "that the anatomic relations of the sphenoid and ethmoid cells to the optic canal are immaterial when it comes to a question of optic nerve involvement in accessory sinus disease. The trouble is transmitted by the soft tissues alone."

Shumway reported a unique case and expressed a very interesting theory in 1915. His patient had failing sight in one eye for nine years. The fundus showed pallor of the temporal half of the nerve and there was a horizontal oval scotoma for colors; vision 2/45.

Nasal examination showed a necrosing ethmoiditis. Three years later, after a slight improvement, his condition became worse and the writer concluded the case was one of insular sclerosis and advanced the theory that it might have been produced by absorption of the toxins from the purulent focus in the ethmoid cells. Such a theory would explain the similarity in the lesions of retrobulbar neuritis due to intoxications and those found in disseminated sclerosis.

Stark in 1916 calls attention to the similarity of the eye symptoms in accessory sinus disease and multiple sclerosis. "The eye symptoms in multiple sclerosis," he says, "are amblyopia, nerve involvement, muscle involvement, including nystagmus, change in the pupil field of vision. . . . As in sinus blindness, these symptoms are not all present in any one case, the diagnosis being made by the presence of one or more."

In speaking of the etiology he quotes Aurbach and Brandt, who say that "the relation of multiple sclerosis to retrobulbar neuritis is interesting in so far as the last named affection, in the great majority of cases, in acute as well as in chronic form, is etiologically referable to various intoxications and infections, arousing the suspicion that multiple sclerosis is likewise based on some organized or unorganized poison, crediting the increased frequency of influenza in the last decade with the greater frequency of multiple sclerosis." He also quotes Parsons, who says: "The pathologic condition is suggestive of the presence of a circulating toxin as the cause of the disease." Stark concludes as follows: "The eye symptoms of multiple sclerosis and sinus blindness, which have previously been considered different diseases, are to my mind the same, one being an advanced stage of the other."

It may be of interest to give the usual findings in cases of multiple sclerosis as outlined by Dr. Kampherstein, who describes the eye symptoms in 37 cases, in 23 of which the diagnosis was positive and in the remaining 14 very probable. Most of the cases occurred in young individuals. In 24 there were ophthalmoscopic changes, the most common being temporal pallor, —bilateral in 8 cases, unilateral in 10 cases,

There was incomplete optic atrophy in 3 cases; complete bilateral optic atrophy in 1; sector-shaped pallor in 2; an optic neuritis in 1; in 5 there was an absolute central scotoma; in 5

a relative central scotoma; in 3 a central scotoma with peripheral contraction of the field; and in one case green was not recognized in the entire field. Nystagmus was present in 30 cases. Of these, 26 had nystagmus only in extreme positions of the eye, while in two there was marked nystagmus, even in the primary position.

Bradburne reported a unique case of optic neuritis associated with implication of the abducens nerve from sphenoid disease. The patient had occipital headaches and double vision for twelve months. Examination revealed a slight weakness of abduction of the left external muscle with some loss of vision and blurring of the left disc. This deviation reached a maximum of 14 degrees some weeks later. The use of cocaine and adrenalin was followed by a profuse thick purulent discharge from the sphenoidal region and a rapid subsidence of the neuritis. There was, however, occasional blurring of the vision for 9 months and at times pain, but the diplopia cleared up. The author says that "the implication of this nerve" (the left abductor) "assisted the localization of the seat of the mischief, for such could scarcely be anywhere else than at its situation on the body of the sphenoid where it traverses the cavernous sinus alongside the carotid artery." "It is possible," he says, "that in this case the sixth nerve may have had an abnormal relationship to the carotid and instead of lying external to the artery, might have laid on its mesial aspect in contact with the bone."

The uselessness of negative findings is well shown by Caldwell, who reported a case in 1892 of double optic neuritis due to unrecognized ethmoid and sphenoid disease. Loss of vision came on during a sea voyage, being preceded by violent pain first in one eye and then in the other. After being examined by many specialists and treated unsuccessfully in various hospitals for two years, his disease was at last correctly diagnosed, although too late to benefit his vision. The pain, which was paroxysmal, was relieved by removal of the middle turbinate and draining the sphenoid sinus, and there was also a marked improvement in his general health, but both optic nerves had atrophied.

Vail, in 1919, reported three cases of monocular retrobulbar neuritis from ethmoid disease, all with negative rhinoscopic findings. Two of these were due to hyperplastic ethmoiditis and one to a suppurative process. In conclusion he

says that in the two cases where "there was no bacterial invasion of the nerve present, there was swelling of the orbital wall of the posterior ethmoidal or sphenoidal cell which pressed the optic nerve in its passage through the optic foramen and caused a strangulation of the nerve at this point. . . . This compression no doubt produces a transverse optic neuritis which, while not due to bacterial invasion, is nevertheless destructive to vision and is followed by more or less permanent atrophy of the optic nerve. . . . The nasal disease that produces this phenomenon is a non-suppurative one, hyperplasia of the ethmoids. . . . The disease should be recognized and operation on the ethmoid performed at once in spite of its being normal in appearance."

The result of delayed surgical intervention is well shown in the report of Schimer, who saw a case of five months' duration with vision right, fingers immediately in front of the eye; the left, with proper correction, fingers at 5 m.; the temporal halves of both discs quite white. As suppurative was found in the accessory sinuses on both sides, the middle turbinates were removed and ethmoids treated. There was slight improvement in the left, but further improvement was impossible as the nerve fibres had already undergone degeneration. An operation on the sinuses when the trouble commenced would, the writer maintained, have stopped the inflammation and saved the vision.

The seriousness of delay and the importance of thoroughness in operating is shown by Risley, who reported a case of marked pathology in a man of 58 who had atrophy of the optic nerve of long standing in one eye and a recent loss of vision to 6/60 in the other. "The nerve was gray-red, opaque, and margins obscured." There was pain in the frontal region and both nares were filled with polypoid masses. On the removal of these a large quantity of pus escaped and vision rose to 6/15. Seventeen months later it dropped to 1/10 and the nose was again filled with polypi. The patient, however, refused any further operative interference and after consulting various specialists, both at home and abroad, eventually became entirely blind, and when examined three years after his first visit had atrophy of both optic nerves.

For referring to me the following cases I wish to express my sincere thanks to the physicians mentioned and also to the house sur-

geons of the Infirmary who have assisted me in every possible way.

The first three cases have been previously published but briefly are as follows:

CASE 1. Miss R. S., 23, referred by Dr. H. B. Chandler on April 12, 1911. Diagnosis: Chronic unilateral retrobulbar neuritis. Nasal examination: Pus about sphenoid. Later developed chronic posterior ethmoid disease. Operation advised but refused. Result: Practically blind in one eye.

CASE 2. Mr. C. J. M., 25, referred by Dr. William J. Daly on November 21, 1913. Diagnosis: Double optic neuritis. Left sphenoid smaller than right. Operation: Removal of left middle turbinate and opening of left sphenoid. Complete recovery.

CASE 3. Miss I. L. P., 21, referred by Dr. F. I. Proctor. Diagnosis: Double optic neuritis. Left eye much worse than right. Operation: Removed left middle turbinate. Complete recovery.

CASE 4. E. G., 25, a machinist, was referred by Dr. Verhoeff at the Infirmary on April 14, 1916, with diagnosis of bilateral retrobulbar neuritis and optic atrophy. History of excellent health excepting a catarrhal trouble of several years' duration. First noticed a foggy vision about two months ago. This came on suddenly and was preceded for several days by severe pain about and behind the eyes. Was treated in the Outpatient department on February 28, 1916. Vision 20/50 right and 20/70 left. Disc of right eye apparently normal; left disc paleness of temporal half. Admitted as a house case 3 weeks later, during which period vision right dropped to 10/200; left 2/200. Pupils reacted normally; vessels normal; left disc pale; central scotoma for red and green. Wassermann and nasal examinations negative. Patient discharged unimproved one week later. Re-admitted the following week with vision in right eye now 2/200, left eye shadows. Right disc now also showed pallor on temporal side. Pupils of both were dilated and did not react to light. I first saw the case ten days later, that is, on April 14th, and had him x-rayed; the "left sphenoid was obscured." After a consultation with Dr. Verhoeff it was decided, in spite of the white discs, to attempt to save the remaining eyesight, so both middle turbinates were removed and the posterior ethmoids opened. As no improvement followed

this operation both sphenoids were opened ten days later; they were filled with pus and granulations. Four weeks after the operation "both pupils reacted fairly well; fundi unchanged." Six months later vision for fingers was 2 feet right, 3 feet left, which was an improvement over the vision before the operation.

This case well illustrates the difficulty of making an early diagnosis, and the rapidity with which optic atrophy develops. It teaches the necessity of an early operation, even when the findings are negative.

CASE 5. V. C., 28, a machinist, was referred by Dr. MacKenzie of the Infirmary, on March 5, 1917. Diagnosis: Double optic neuritis. He was first seen in the Ophthalmic Outpatient on March 3, 1917, and gave a history of loss of sight in the right eye for two weeks; vision, fingers 1 foot right, 20/200 left; physical, neurological and Wassermann examinations all negative; both pupils dilated, the right responding to light but little and the left fairly well. He was seen by me two days later and admitted as a house case. Vision on admission: right eye, fingers at 1 foot; left eye, 20/200, thus showing a marked loss in the left eye in the past 48 hours. Dr. Quackenboss examined the case and reported "the disc of the right eye pushed forward about 2 diopters; considerable exudate on and about it; the edges lost, the retinal veins enlarged and tortuous. The left disc also showed marked neuritis but no swelling. Although nasal examination was practically negative I at once removed the right middle turbinate and opened the right sphenoid. There was swelling of the mucous membrane,—probably a case of hyperplasia. Within 24 hours the vision commenced to improve and when the patient was discharged 12 days later it was nearly normal. On May 18th, ten weeks after the operation, Dr. MacKenzie reported both visual fields and discs normal, except that the right nerve head was possibly a little paler; vision 20/20 both.

CASE 6. Miss M. C., aged 21, telephone operator, came to the Ophthalmic Outpatient on September 8, 1917. Diagnosis: Unilateral retrobulbar neuritis. She was admitted at once as a house case. History of good health, not subject to colds, but periodic attacks of severe pain over left eye at which times vision had been blurry for a few hours, but never so bad as at present. This attack came on five days ago with

an unusually severe pain over and about the eye. It hurt when she tried to look sideways. The vision was entirely gone for three or four days, and the eye sensitive to pressure. Dr. Quackenboss found a slight blurring of the edges of the left disc. The pupil was enlarged but responded slightly to light. Vision, light perception only. The septum was deflected to the left and the middle turbinate greatly swollen from a subsiding coryza. The septum was resected at once and the anterior end of the middle turbinate removed. Following this the vision improved so that within 48 hours fingers could be made out close to the eye. One week later fingers at 15 feet. The patient unfortunately contracted another severe cold and for ten days the vision was greatly diminished, but thereafter improved, although it never became quite normal. As the swelling accompanying the coryza disappeared it was found that the posterior portion of the left middle turbinate, the location of which it had previously been impossible to determine, was obstructing the opening to the sphenoid and it was removed together with the front wall of that sinus. The pressure on the nerve had, however, caused slight atrophy. Dr. Quackenboss examined the patient on November 8th, two months after the operation, and reported: "Right eye normal; left eye vision 20/30; the optic nerve is pale and shows evidence of partial atrophy." In March, 1919, the patient had some pain and blurriness of the other eye but this cleared up under treatment without impairment of vision. On examination by Dr. Quackenboss on May 10, 1919, the left disc was still paler than the right and there was a certain amount of optic atrophy, although the vision had improved in the past 18 months from 20/30 to 20/20 minus, thus showing that there may be improvement some months after the operation.

CASE 7. Mrs. M. J., 37 years old, came to the Ophthalmic Outpatient on September 17, 1917. Diagnosis: Bilateral retrobulbar neuritis. History of severe pain in head for 24 hours, when she noticed that the right eye was blurry; and in three days it was totally blind. One week later similar trouble came on in the other eye so that she had to be led into the Infirmary. She was admitted as a house case and improved under local treatment for 3 or 4 days, then became worse,—no light perception in

right eye and fingers barely in the left. Her history pointed toward specific disease, so operation was delayed until the Wassermann report was obtained. This was negative, as were also the neurological, x-ray, and nasal examinations. The right middle turbinate was then removed and the right sphenoid opened. Thickened mucous membrane was found—probably a true case of hyperplasia. The sight in the eye on this side commenced to improve within 24 hours. A week later the left middle turbinate was removed, and the left sphenoid and posterior ethmoid opened. Improvement thereafter was rapid. The patient was examined several times by Dr. Quackenboss, who was able, day by day, to note the changes in the fundi. Four days after the opening of the left sphenoid he reported that there was still marked neuritis. On the twelfth day he noted "marked improvement; neuritis subsiding; edges of discs made out fairly well; vessels nearly normal." Two days later he reported "right eye, neuritis subsiding; edges of disc quite distinct; nerve has slight pallor; left eye, edges of disc fairly distinct; one or two vessels a little twisted." The patient when seen three months later had practically normal vision.

CASE 8. Miss H. H., 17 years old, was referred on March 15, 1918, by Dr. Fred M. Spalding of the Infirmary. Diagnosis: Bilateral retrobulbar neuritis. History of very severe pain in head some six weeks ago which was followed by marked bilateral loss of vision. Examination showed blurring of both discs and marked neuritis right. She was referred to the Massachusetts General Hospital as the trouble at first was thought to be due to pituitary disease. Neurological, x-ray, and Wassermann examinations all negative. Vision left, fingers at 3 feet; light perception only in right. Nasal examination negative except a deflection of the septum. This was resected on March 15th and the right middle turbinate removed. Six days later the right sphenoid was opened. No pus or granulations, but a hyperplastic condition found. The patient was discharged in 9 days with vision 20/20 left and 20/30 right. The right fundus still showed a slight neuritis. Two weeks later the antro-nasal wall was broken down and a diseased molar extracted. There still persisted a slight blurring of the disc in the right eye, but on July 9th, some four months after the operation, both

diseases were cleared and the vision 20/20 both.

CASE 9. Miss M. C., aged 20, was referred by Dr. Verhoeff. She entered the Infirmary April 6, 1918, with exophthalmos of the left eye. For the past two weeks, following a severe cold, there had been pain and swelling about the left eye. The eyeball was pushed forward and outward; vision 20/20 and fundus normal. There was tenderness over the ethmoid region and a moderate conjunctivitis. A diseased molar was extracted by Dr. Wright. On the 9th I examined her nose, which was negative, but as some sinus disease was suspected she was x-rayed; the plates were negative, however, as were also the physical, neurological, and Wassermann examinations. With the subsidence of the exophthalmos the patient first noticed a fogging in her vision, and on April 21st, some two weeks after her admission, the fundus on being again examined showed a commencing choked disc. This grew rapidly worse so that within 4 or 5 days her vision dropped to 20/200 and the fundus showed marked engorgement. On April 27th, 6 days after the neuritis was noticed, I removed her left middle turbinate and opened the sphenoid and the posterior ethmoid. The patient improved rapidly and was discharged a week later with vision 20/50. One month later, when the left fundus was normal and the vision 20/20, the other eye commenced to pain and the vision became blurry. Dr. Verhoeff found a marked papillitis, with vision 20/200, so she was re-admitted to the Infirmary and on June 12th I removed the right middle turbinate, which was tightly wedged between the septum and ethmoidal wall, and opened the right sphenoid. Eight days after the operation the patient was discharged with normal vision. She went along favorably for six weeks, when, following a cold, the pain returned about the left eye (the first one affected) and there was diminution of the vision. The left antrum was dark on transillumination, and there was slight blurring of the left disc with vision 20/30; so on July 24th all the posterior ethmoids on the left were exenterated, the opening in the anterior wall of the sphenoid enlarged, and a permanent opening made into the antrum, which, by the way, was filled with pus. Patient discharged a week later with vision normal, which remained so for 4 months, when, following a severe cold, there was some pain in

the left eye and a blurriness for two days, but this subsided under local treatment.

This case is unique, at least in my experience, as the optic neuritis of the left eye developed while the patient was under treatment at the Infirmary for the exophthalmos of that eye. The neuritis in the right eye came on some weeks after that in the left had subsided; then there was a recurrence of the neuritis in the left eye some weeks after that in the right was cured. The first operation on the left side was the removal of the middle turbinate, an opening into the sphenoid and the posterior ethmoid cell. This is usually sufficient but was not so in this case. That the optic nerve, while not in relation to the other accessory sinuses, may yet become involved from the toxæmia of the infection, is, I believe, well demonstrated by this case.

CASE 10. Miss M. E., 27, a patient at the Infirmary with neuro-retinitis and choroiditis of the right eye, was referred by Dr. Verhoeff on April 16, 1918, more with an idea of seeing what effect the opening of the sinuses would have on the retina than with the expectation that the vision could be benefited. Ten years ago she had paresis of the right facial but no cause; monthly headaches since a child. About three months ago patient noticed that inner half of field of vision was gone in the right eye. This lasted for about one week, then the other half began to go, so that now she has light perception only. About two weeks ago the eye began to turn out: pupil round, regular and reacts to light; fine floating vitreous opacities; disc swollen and edges not seen; tension normal. The left eye was normal. X-ray of sinuses, Wassermann neurological, and nasal examinations all negative. On April 20th I removed her right middle turbinate and opened the sphenoid. The membrane was somewhat thickened, but no pus or granulation. Patient was discharged a week later with no improvement. Some 6 or 7 weeks after this the pain in the right side of the face, which she had had occasionally, became constant and of such intensity that acetyl-salicylic acid in 10-grain doses was required nearly every hour. In the region of the posterior ethmoids soft polypoid tissue was found which, on account of the severity of the pain, was suspected of malignancy, but a small portion removed for examination was negative. Although the Wasser-

mann was negative, Dr. Verhoeff suspected specific disease and had given the patient injections and potassium iodide for some weeks. On July 10th I cleaned out her ethmoids. Granulations and pus were found. The pain, which had continued up to that time, was entirely relieved and had not returned when seen six months later. This was also true of her periodical sick headaches. The general health was also much better, but the vision was unimproved.

(To be continued.)

### Book Reviews.

*Symptoms of Visceral Disease.* By FRANCIS MARION POTTENGER, A.M., M.D., LL.D., F.A.C.P. St. Louis: C. V. Mosby Company, 1919.

In spite of the fact that the modern tendency in medical practice is toward specialization, the author of *Symptoms of Visceral Disease* points out that it must be recognized that the human body is a unit and that diseases cannot be divided into those belonging to special organs, but must be considered in relation to other organs and to the body as a whole. This book attempts to interpret in terms of visceral neurology symptoms which are found in every-day clinical observation of visceral disease. The author emphasizes the importance of the vegetative nervous system and its relation to clinical medicine, believing that the vegetative nerves and the products of the endocrine glands are the medium through which visceral symptoms are expressed.

The book is divided into three main divisions. In the first is discussed the relationship between the vegetative nervous system and the symptoms of visceral disease, with the practical application of the principles of visceral neurology to clinical medicine. The author considers the classification of symptoms of disease, segmentation of the body, viscerogenic reflex, reflexes whose afferent impulses course in the sympathetic and in the parasympathetic nerves, and sympathetic and parasympathetic syndromes.

In the second part, the author has discussed innervation of important viscera, and presents a clinical study of the more common viscerogenic reflexes. In the third section is given a brief review of the vegetative nervous system. This book emphasizes the importance of more accurate clinical observation and interpretations, with due consideration of the patient as well as of the disease.

*The Health Officer.* By FRANK OVERTON, M.D., D.P.H., and WILLARD J. DENNO, M.D., D.P.H. Philadelphia and London: W. B. Saunders Co., 1919.

The work of the public health officer covers a wide field of preventive medicine, involving a great variety of duties. This volume, "The Health Officer," describes these activities and explains how and why the work should be organized and carried out. The relation of the public health officer to the boards of health, to physicians, social agencies, and the public is a leading one. His qualifications are many; he must undertake to suppress and prevent communicable diseases, to supervise laboratories, water supplies, and public buildings, to record vital statistics, to undertake the medical supervision of school children and the correction of their defects; to conduct infant welfare work and develop educational measures. This book outlines the methods which have been found to be most effective in coping with his work, describes the various diseases and unsanitary conditions with which it is necessary to deal, and explains the scientific principles of preventive medicine. It is written in simple and untechnical language, and although designed primarily for public health officers, it will be found valuable also to college students, public health nurses, members of boards of health, social workers, and teachers.

*Chemistry for Nurses.* By FREDUS N. PETERS, A.M., Ph.D. St. Louis: C. V. Mosby Company, 1919.

This textbook, *Chemistry for Nurses*, is an unusually interesting, scientific, and truthful exposition of the fundamental principles involved in the science of chemistry. The book has been written primarily for nurses, but it is so clearly and simply written that it will be found of general interest to others and of great practical value. The author has tried to avoid technical terms as far as possible, although chemical theory has been introduced when necessary for an understanding of phenomena. In an introductory chapter are discussed the ancient theories of matter and the reasoning of ancient philosophers, which are contrasted with modern ideas and experimental methods. The composition and uses of water, hydrogen, oxygen, ozone, and hydrogen dioxide, common salt and sodium, chlorine and the halogen family, carbon, sulphur, nitrogen, silicon, and magnesium, and the properties and uses of metals, including aluminum, copper, lead, and iron, are considered. In addition to substances which can be made useful, a careful study is made of other elements which are poisonous. In the appendix are added various tables which will be found helpful. The book is amply illustrated, and systematically presented.

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## WORLD ACTIVITIES OF THE RED CROSS.

PERHAPS no other report contains so complete a picture of the activities of the Red Cross throughout the world as the *Revue Internationale de la Croix-Rouge*, a recently organized French publication of which only two or three numbers have as yet been printed. It surveys the work of the Red Cross in various departments and in many countries. The Red Cross has protected prisoners, protested against military outrages, made international appeals in the interest of humanity, and has devoted itself to the alleviation of suffering all over the world. Thousands of Russian prisoners have been protected and aided in adjusting themselves to old methods of life; prisoners in Germany, Lithuania, Galicia, and Roumania are looking to the Red Cross as an active agent in their deliverance. The Red Cross has appealed to Italy,

Portugal, and Japan, for the repatriation of civil prisoners and the improvement of their condition until released. Steps have been taken for the hospitalization in Switzerland of a group of ex-military Bulgarians coming from Germany. Bulgarian prisoners in France have been assisted and lists are being completed of civil prisoners. The Red Cross has also secured information about civil prisoners in China. These and other activities illustrate the international service rendered by the Red Cross.

Publications from different countries give evidence of the wide humanitarian purpose and achievement of the Red Cross. In Frankfort, the foreign section of the Red Cross has undertaken important services. It has cleared up the mysteries surrounding thirty-five thousand men, established a registration of the new allied prisoners in German camps, and has transmitted messages to the civil population occupied by the Germans. Communications have been sent between children separated from their parents who remained in invaded districts.

The Red Cross report from Denmark mentions chiefly the help given during the recent influenza epidemic. *La Cruz Roja* of Spain relates the work undertaken at the time of the inundations at Malaga in November, 1918. In France, the *Croix-Rouge* deals chiefly with the repatriation of prisoners and protests against German offences. The record of the Scotch section of the Red Cross describes the ambulance service which it has maintained. It established a base hospital at Rouen and furnished the equipment for more than 6,000 beds. Since 1914, the mileage of this section has been about 4,000,000, and the number of soldiers transported, 1,700,000.

The English Red Cross Society spent more than six and one-half million dollars annually. Its service included the maintenance of ambulance automobiles in France, Salonica, Russia, Egypt, and Mesopotamia; hospital trains in France, lazarets and first aid stations near the fields of battle. The English staff consisted of about one thousand workers; in October, 1918, the organization had in England 1,666 hospitals with eleven others accepted and used by the Admiralty, besides five general hospitals in France, three base hospitals, and fourteen small special hospitals. The Canadians maintained twenty-one hospitals in England. The English Red Cross rendered noble service to the Italians in sections evacuated by the Austrians.



The Japanese Red Cross cared for hospitals opened at Vladivostok. A Montenegrin Red Cross was maintained at Geneva during the war. A Swedish Red Cross cooperated with the Norwegian and Danish organizations in aiding prisoners in Russia. In Switzerland, considerable work was done by the Rote Kreuz in combating influenza, and, aided by funds from the American Red Cross, stations were opened in the Bernese Oberland. The Russian Red Cross put at the disposal of the armies of the southwest twenty-two hospitals of two hundred beds each, two smaller ones of five beds, two field hospitals, five ambulances, and a staff; the number of hospitals was later increased to one hundred and thirty, with numerous staffs. The fact that there were 1,221,276 patients in these hospitals gives some evidence of the splendid work accomplished in that country.

There are forty Red Cross national organizations at the present time: two in North America, eight in Central and South America, twenty-seven in Europe and the Red Crescent of Turkey, and two in Asia. The Red Cross has devoted itself to the relieving of human suffering in the past; in the future it will endeavor to be of even greater service—in the prevention of disease.

#### MEDICAL EDUCATION IN NEW YORK.

In order to promote medical education in New York and in this country, the New York Association for Medical Education, with a fund of fifty million dollars, will endeavor to make New York a leading city in the world of medicine. The teaching facilities, clinical resources, and eminent physicians and surgeons of that city are among the best in this country, and it is hoped that by coördination of these resources American medicine may be considerably advanced.

The purpose of this organization will be to improve and amplify the methods of undergraduate and graduate medical teaching; to perfect plans for utilizing the vast clinical material which there is in New York City for teaching purposes and to make use of teaching talent now unemployed; to bring about a working affiliation of the medical schools, hospitals, laboratories, and public health facilities of the city to the end that the best interests of medical education may be conserved; to initiate the estab-

lishment of a medical education foundation in New York whereby funds may be secured to meet the financial requirements of all forms of medical education and investigation.

The New York Association for Medical Education will include a general membership of physicians and surgeons, both allopaths and homeopaths, and will be governed by a corporation of one hundred and fifty men, including medical teachers, medical men with hospital appointments, those affiliated with hospital teachers of ancillary sciences, and medical investigators. From this governing group of men and elected by it there will be a board of fifteen trustees, to direct the teaching and manage the business affairs. The officers of this organization include the following men: President, Dr. Wendell C. Phillips; first vice-president, Dr. George D. Stewart, president of the New York Academy of Medicine; secretary, Dr. Haven Emerson, a former commissioner of health of the City of New York; and treasurer, Dr. Arthur F. Chace, superintendent of the Post Graduate Medical School and Hospital.

The war was, perhaps, partly instrumental in the organization of this movement. Before 1914, many doctors went to Austria and Germany for post-graduate medical education, believing they could gain something from the clinics of these countries which they could not get at home. During the war, London became the centre to which many Americans went for post-graduate work and studied at the Royal Society of Medicine and the Royal College of Surgeons. The London medical organization which is to direct this work in the future is the Association for Post Graduate Medical Instruction. Although Americans will still go to London for post-graduate work to some extent, there is no reason why New York should not afford equal opportunities. The Post Graduate Medical School in New York, which is connected with the Post Graduate Hospital, has the largest registration in its history for the coming fall term, with a total of more than a thousand students.

At the present time, medical colleges are beginning to recognize the need of advanced study and practical experience beyond the limits of undergraduate study, and it is probable that before long the medical course may be changed to five years. The Association for Medical Education will greatly assist this future development. In time it will have a post-graduate medical school and hospital in which will be brought

together all the teaching resources of New York. Coöperation with other medical schools in the country and in great Britain will make it possible for students to learn what is being done in other cities, and may result in drawing English students here rather than sending Americans to London. New York has many factors to make for the success of this project, among them more than a hundred hospitals and numerous clinics and dispensaries. There are fifty or sixty general hospitals and the special hospitals include those devoted to women, babies, tuberculosis, mental and nerve cases, the eye and ear, cancer, skin diseases, scarlet fever, and diphtheria, orthopedic work, dentistry, and insanity. There is also an osteopathic infirmary, a floating hospital, and one for chronic diseases. Among the teaching institutions are the Columbia College of Physicians and Surgeons, Cornell Medical College, Bellevue Hospital Medical School, and the Long Island College Hospital. The post-graduate medical school of the Poly-clinic Hospital has been used for army purposes, but it is believed that it will probably be reorganized by 1920.

The New York Association for Medical Education will bring together all the facilities which that city offers for the advancement of medical education; it will keep in close touch with medical activities and progress in all parts of this country, and will probably make some arrangement with a similar organization in London. If the plans which the Association has made can be fulfilled, New York will become one of the leading medical centers of the world.

#### THE NEED OF MEDICAL MISSIONARIES IN CHINA.

IN spite of the efforts which are being made by American and other missionary boards, by the medical schools of Harvard, Yale, and the University of Pennsylvania, and by the China Medical Board which was organized by the Rockefeller Foundation, there is still an urgent need of a greater number of medical missionaries in China. The *Journal of the American Medical Association* has reviewed the status of medical education and practice in China. There are twenty-six medical schools, five of which are

at the medical Colleges of China; only colleges which provide a four-year medical course and which require for admission two or more years of college work, including courses with laboratory work in physics, chemistry, and biology, are admitted to this association. The China Medical Board of the Rockefeller Foundation is erecting at Peking and Shanghai two practically new medical schools, including premedical departments. The Foundation is aiding other medical schools in China,—the Shantung University School of Medicine at Tsinan, The Hunan-Yale College of Medicine at Changsha, and the medical schools of Nankin, Canton, Soochow.

Although provision is being made for adequate medical education in China which will in time develop and fulfil the needs of the country, the actual medical practice in China today is not sufficient to care for the population and to prevent China from being the source of many of the epidemics which may sweep over the entire world. For the estimated population of more than 400,000,000 people, including Manchuria and Mongolia, there are only 2,000 scientifically trained physicians. During 1917 there were in China 351 foreign medical missionaries who had assisting them 212 foreign physicians; these physicians cared for about 120,000 hospital in-patients during that time, and still the medical service was not adequate. The medical practice of the entire world must combine to check disease wherever it is found—there is a great need and a great opportunity in China.

#### OBSTETRICAL DEPARTMENT AT CARNEY HOSPITAL.

It will be of interest to the profession to know that an Obstetrical Department has been opened at the Carney Hospital in South Boston under the direction of the Gynecological Staff. It has been equipped with all modern appliances, and will afford excellent facilities for the treatment of all obstetrical emergencies. Private rooms, private wards, and a general ward are now ready for the reception of patients. The service of a pre-natal clinic, which will be held every Thursday afternoon at three o'clock at the Out-Patient Department, will be appreciated.

## MEDICAL NOTES.

RECUURRENCE OF INFLUENZA EPIDEMIC.—At a recent meeting held by the women physicians who are holding an international conference in New York, it is reported that Dr. William H. Park, of New York, stated that he believed that there would not be a recurrence of the influenza epidemic this winter. He is of the opinion that although we have not yet discovered a specific vaccine to protect us against influenza, we can find a moderate protection against pneumonia, bronchitis, and respiratory diseases in general from vaccination with several fixed strains of organisms found in respiratory diseases.

POST-GRADUATE TEACHING IN LONDON.—It has been announced in the *British Medical Journal* that the Fellowship of Medicine has decided that the emergency course which was instituted in London last spring should be continued. It is hoped that in time this may become a permanent organization, with a house and perhaps a hospital of its own. This course has been of great benefit to medical officers of the Dominion and of the United States, and also to many holding territorial, special reserve, or temporary commissions.

CHOLERA IN PETROGRAD.—A recent report from Stockholm states that from two to three hundred persons are dying daily in Petrograd from cholera. Sanitary conditions are becoming more and more intolerable, and many hospitals have been closed because of lack of medicines and food. The Government has issued a decree ordering all hospitals managed by Sisters of Mercy to discontinue their work.

DRUG PRICES.—The following quotations of drug prices have been published recently: Domestic colors are active. While a consignment of Swiss colors was received, it did not supply the demand, because the entire lot had been sold ahead. Aniline oil and salt advanced, and the improvement in the oil caused firmer conditions in the paranitraniline market. Albumen is lower.

The essential oil market is easy. Lemon oil is lower. Menthol and peppermint oil are higher on reports of scarcity and holders are loath to sell.

The situation in domestic medicinal drugs is becoming acute and prices are still tending up-

ward. Factories that were handicapped by the strike of employees recently are still short of powdered crude drugs, owing to the shutdown of drug mills, but the strikes are practically settled and no further delays are anticipated. Tartaric acid and phenolphthalein are lower.

Quinine is decidedly firmer. Menthol and camphor are higher. Glycerine is easier. Quicksilver is sharply higher. Oil of peppermint is stronger. Senna is tending upward. Botanical drugs are not so active. American colors are in good demand both for export and domestic use. Bright colors are wanted in the Far East. Chromes are the principal feature of the local market. Shipments of phenol are being made at Government prices. Aniline oil and salt are higher. Few shipments of intermediates are being made on spot orders owing to the scarcity of these coal-tar products.

There were few changes in the essential oil market, but there is an undercurrent of strength. Short flower crops and labor troubles have caused a limited production of volatile essences, and prices are likely to advance further.

Pronounced weakness was apparent in the oil market, following the declines in vegetable oils, last week. Purchases are being made only for immediate needs. Linseed, cottonseed, coconut, peanut, and soya bean oils all display weakness and prices have been cut sharply.

In heavy chemicals caustic soda and soda ash are in less demand for export owing to the exchange situation. Potash salts are firmer and there is an increasing scarcity. Many acids are difficult to obtain for spot delivery and producers are booked ahead, especially for sulphuric. Bleaching powder is firmer.

WAR ACTIVITIES OF THE ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH.—The following letter of appreciation of its activities during the war has been received by the Rockefeller Institute for Medical Research from Merritt W. Ireland, surgeon-general of the United States Army:

"During the war, which is now happily past, your Institute proved to be one of America's strongholds. I am informed that from the beginning to the end of hostilities the entire institution was placed by you at the disposal of the War Department and that you did work of the greatest value, not alone for the Medical Department but for the Chemical Warfare and Air Service; that your hospital as well as your

laboratories became in effect as much a part of the army as the hospitals and laboratories established by the War Department in our cantonments.

"I have also been informed that this great work, extending over the whole period of our participation in the war, was paid for entirely out of your own funds, and was without further support from the government than the routine payment of salaries of such members and assistants of the Institute as became part of the Medical and Sanitary Corps.

"I thank you for your work of patriotism and your generosity in placing so fully at the disposal of the Medical Department your great and productive facilities for research, for teaching, and for the care of the sick."

**CHIROGRAPHY OF PHYSICIANS.**—The Kansas State Board of Health bulletin for July calls attention to a fact which is only too true—that the chirography of physicians is so illegible that very few of the names of the A. E. F. medical officers could be read with certainty. It is to be remembered that carelessness in this respect leads to difficulties in filing, and a baby may lose its birthright because the physician failed to write his name clearly.

**VISITING NURSING IN NORTH DAKOTA.**—The State Board of Health of North Dakota is making a survey of the nursing resources of the State. The legislation of 1919 provides for the physical examination of school children and the employment of a nurse, and a questionnaire is being sent to all communities in order to discover the present status of nursing work and the number of nurses that will be needed.

**APPOINTMENT OF MME. CURIE.**—Mme. Curie, one of the discoverers of radium, has been appointed professor of radiology in the Warsaw University.

#### BOSTON AND MASSACHUSETTS.

**WEEK'S DEATH RATE IN BOSTON.**—During the week ending September 27, 1919, the number of deaths reported was 178 against 992 last year, with a rate of 11.66 against 65.95 last year. There were 35 deaths under one year of age against 68 last year.

The number of cases of principal reportable diseases were: Diphtheria, 83; scarlet fever, 19;

measles, 33; whooping cough, 9; typhoid fever, 2; tuberculosis, 43.

Included in the above were the following cases of non-residents: Diphtheria, 9; scarlet fever, 3; typhoid fever, 1; tuberculosis, 4.

Total deaths from these diseases were: Diphtheria, 2; whooping cough, 1; tuberculosis, 19.

Included in the above were the following non-residents: Tuberculosis, 3.

Influenza cases, 21; influenza deaths, 3.

#### RED CROSS APPOINTMENT FOR DR. EMERSON.

—Dr. (Major) Kendall Emerson of Worcester has been appointed Acting Medical Director of Foreign Operations by the Red Cross. He recently sailed for Paris, where he will have headquarters, and serve as Medical Advisor in the General European Program of Public Health and Sanitation. He was accompanied by his family and will remain there at least one year.

Dr. Emerson served with the Harvard Surgical Unit from November, 1916, to December, 1917, in the British service. He entered the American service in January, 1918, and was assigned to the orthopedic division in the Surgeon General's office in Washington. In June, 1918, he was given charge of the amputation service at the Walter Reed hospital. In January, 1919, he sailed for Siberia as one of a special commission sent by the Red Cross to study conditions there. Shortly after his return he received his present appointment.

**APPOINTMENTS AT WORCESTER CITY HOSPITAL.**—Dr. Ernest L. Hunt (Harvard 1902) has been appointed Director of Surgical Services, and Dr. Edward B. Bigelow (Harvard 1904) has been appointed Director of Medical Services at Worcester City Hospital.

Dr. Hunt and Dr. Bigelow are both enthusiastic students of medical progress and experienced laboratory workers. Both will give full time to the service of the hospital. It is expected that the addition of a progressive surgeon and a progressive physician as full time continuous service advisors and instructors of the internes and junior members of the visiting staff will make for a better service and be worth the cost. The hearty cooperation and assistance of the senior members of the visiting medical and visiting surgical staffs seems assured.

**APPOINTMENT OF DR. HUGH CABOT.**—Dr. Hugh Cabot of Boston has been appointed chief surgeon of the University of Michigan. This university requires its professors to give up their private practice and devote their entire energy and interest to the duties devolving upon them as professors in the university and as state officers.

Dr. Cabot has held many positions of importance in this city. At present he is clinical professor of G. U. surgery at the Harvard Medical School, chief surgeon of a surgical service at the Massachusetts General Hospital, and director of clinics of the State Board of Health. He received his medical degree from Harvard Medical School in 1898, and later was made a fellow of the American College of Surgeons. In 1916, Dr. Cabot went to England with the Harvard Unit and was Officer in Command of General Hospital 22, B. E. F., with the rank of lieutenant-colonel. He was made a companion of the Order of St. Michael and St. George in recognition of his work with the British forces at the front. Dr. Cabot returned to this country last February. It is expected that he will not begin his new duties until the first of January.

**WOMEN PHYSICIANS IN BOSTON.**—The following women physicians, who have been holding a medical conference in New York, were the guests of the Boston Equal Suffrage Association at the Chilton Club on September 27, and later visited Harvard, Radcliffe, and Wellesley colleges:

Dr. Mary Gordon, Dr. Christine Murrell and Dr. Constance Long, London, England; Dr. Frances Johnston, Edinburgh, Scotland; Dr. Alice Armand-Ugon, Montevideo, Uruguay; Dr. Alicia Moreau, Argentine; Dr. Louise Isaacsens, Dr. Kristine Munch, Dr. Dagny Bang, and Dr. Regine Stang, Christiania, Norway; Dr. Marie Feyler and Dr. Natalie Wintseh-Maleef, Lausanne, Switzerland; Dr. Clella Potter, Utrecht, Holland; Dr. Clella Lollini, Rome, Italy; Dr. Marguerite Giboulot and Dr. Thuiller-Landry, Paris; Dr. Yvonne Pouzin, Nantes; Dr. Anna Moutet, Lyons, France; Dr. Alma Sundquist, Stockholm, Sweden; Dr. Tomo Inonye, Tokio, Japan; Dr. Radmilla Lazarewitch, Washington Legation of Czecho-Slovakia; Dr. Ellen Burt Sherritt, Dr. Helen MacMurely, Dr. Anna Young, Dr. Rosamond Leacock, and Dr. Mary E. Crawford, Canada.

**INFLUENZA IN LAWRENCE.**—Two cases of influenza, neither of which is considered serious, have been reported from Lawrence.

**APPOINTMENT OF DR. VICTOR C. JACOBSON.**—Dr. Victor C. Jacobson, resident pathologist of the Peter Bent Brigham Hospital, has been appointed assistant professor of pathology in the University of Wisconsin.

**POSSIBILITY OF INFLUENZA EPIDEMIC IN MASSACHUSETTS.**—It has been reported that Dr. Bernard W. Carey, director of the Division of Communicable Diseases of the State Department of Health, has expressed the opinion that there will not be an epidemic of influenza this season. Up to September 24, there have been reported one hundred and forty-four cases from different sections of the State; during the same month last year there were thousands of cases.

Dr. Carey believes that there is little to fear provided individuals follow strictly the ordinary precautions and rules of health. He advocates plenty of fresh air and sunshine, nourishing food, and at least eight hours of sleep each night. In case there should be an epidemic, the State Health Department is prepared to meet it. For eight months it has been gathering data which will aid in meeting an epidemic if it recurs. A survey has been made of the available equipment in every city and town in the State, and the number of local nurses and doctors, the number of beds in the hospitals, and names of health and other officials and organizations whose assistance would be of value have been recorded.

**GIFT TO LAWRENCE GENERAL HOSPITAL.**—The sum of fifty thousand dollars was bequeathed to the Lawrence General Hospital in the will of the late Charles H. Tenney.

**INFLUENZA IN BOSTON.**—Twenty-one new cases of influenza and three deaths were reported to the Boston Health Department during the week ending September 27. During the corresponding week last year there were six hundred deaths, and probably about one thousand cases.

#### NEW ENGLAND NOTES.

**MAINE ANTI-TUBERCULOSIS SOCIETY.**—At the annual meeting of the Maine Anti-Tuberculosis Society held in Portland on September 24, Dr. Eugene W. Kelley of Boston spoke on the advantages of open-air schools.

Dr. C. P. Merrill of Bangor, president of the Society, reported a membership of about eight hundred, an annual income of from nine thousand to twelve thousand dollars, and a contemplated expenditure of thirty-five thousand dollars during the coming year.

The following officers were elected: President, Dr. E. D. Merrill of Foxcroft; vice-presidents, Dr. S. J. Beach of Augusta and Henry Richards of Gardiner; secretary, A. J. Torsleff of Bangor; and treasurer, Carl E. Danforth of Bangor.

## Correspondence.

UNPRINTED ITEMS BY SIR THOMAS BROWNE.  
*Mr. Editor:*

This writer is cherished by so many readers that attention should be called to an article in the (London) *Times' Literary Supplement* for Sept. 9, 1919, p. 470, which may be seen in any of the large libraries. This describes the newly-discovered contents of a manuscript book by the second of the seven daughters of Dr. Browne, to whom she read "at nights" an appalling number of volumes therein listed. It contains the earliest of his known compositions and his only poem, "Upon a Tempest at Sea." Everyone interested in tuberculosis can read with profit a fragment—"Of Consumptions"—on the theme that this alone of the great diseases is nowhere praised, although "He that Prays against tormenting diseases or sudden death hath his Letany heard in this disease, which is one of the Mercyfullest executioners of Death."

ALFRED ELA.

## SOCIETY NOTICES.

SUFFOLK DISTRICT MEDICAL SOCIETY.—A stated meeting of the Society will be held at the Boston Medical Library on Wednesday, Oct. 29, 1919, at 8.15 P.M.

1. Business: Election of Nominating and Auditing Committees.

2. There will be three fifteen-minute papers:

"Types of Diseased Conditions Most Frequently Seen in the Teeth and Their Diagnosis," Leroy M. S. Miner, M.D., D.M.D.

"Teeth from an Orthopedic Point of View," Robert W. Lovett, M.D.

"The Relation of the Teeth to the General Health," Charles H. Lawrence, Jr., M.D.

It is hoped there will be a general discussion. Guests will be welcome at the second part of the meeting, which will begin about 8.45 P.M.

JOHN BAPTIST BLAKE, M.D., *President*.

GEORGE GILBERT SMITH, M.D., *Secretary*.

THE NEW ENGLAND WOMEN'S MEDICAL SOCIETY will meet in the Boston University building, Boylston Street, corner of Exeter, on Thursday, October 16, at 8 P.M. This meeting will take the form of a memorial to Dr. Sarah Bond Fraser. Different aspects of her life and work will be presented by the following speakers: Dr. Anna Richardson, Dr. Hannah G. Myrick, Dr. Marian Nufe, Dean Bertha M. Boody, and Mrs. A. W. Goodnow.

ALICE H. BIGLOW, M.D., *Secretary*.

## NOTICES.

CENSORS' MEETING.—The Censors of the Suffolk District Medical Society will meet for the examination of candidates at the Medical Library, No. 8, The Fenway, Thursday, Nov. 6, 1919, at four o'clock.

Candidates should make personal application to the Secretary and present their medical diploma at least one week before the examination.

The Secretary will be at his office daily between 4 and 5 P.M.

GEORGE GILBERT SMITH, *Secretary*,  
352 Marlborough Street.

THE TRUSTEES OF THE MASSACHUSETTS GENERAL HOSPITAL invite the members of the medical profession to attend the Ether Day Address by Dr. Richard C. Cabot, on Oct. 16, 1919, at 4 o'clock.

## MARRIAGE.

DR. HAROLD QUINCY GALLUPE, of Everett, married recently Miss Janet Gladys Lyon, daughter of Mr. and Mrs. George I. Lyon of Hingham. Dr. Gallupe is a graduate of Tufts College, 1911, and Harvard Medical School, 1918.

## RECENT DEATHS.

DR. AUGUST HOCH died recently of nephritis in the University Hospital in San Francisco. Dr. Hoch was born at Basle, Switzerland, fifty-one years ago. He was graduated from the University of Pennsylvania and later studied at Johns Hopkins University. He became a member of the staff of the McLean Hospital in Boston, and later became first assistant at the Bloomingdale Sanitarium. For seven years Dr. Hoch was director of the Psychiatric Institute on Ward's Island, New York.

DR. THOMAS I. DEACON died recently, after an illness of two years, at the home of his father in Cambridge. Dr. Deacon was born in Brooklyn, New York, thirty-seven years ago. He was graduated from the Tufts Medical School in 1896, and until last May, he practiced in Boston. He was a member of the Massachusetts and the American Medical Societies.

PROFESSOR ALEXANDER MACALISTER, F.R.S., professor of Anatomy in the University of Cambridge, died, at the age of seventy-five years, on September 2.

DR. C. A. MERCIER died on September 2, at the age of sixty-seven years. Dr. Mercier was a physician for mental diseases at the Charing Cross Hospital.

DR. WILLIAM SMITH GREENFIELD, Professor of Pathology and Clinical Medicine in the University of Edinburgh from 1881 to 1912, died recently.

DR. ALFRED LAVIGNE, for many years a practising physician in Lowell, died recently at the home of his nephew in Nashua, New Hampshire, at the age of seventy-nine years.

DR. JULIET H. SEVERANCE, the first woman in the United States to receive a medical degree, died recently at the home of her daughter in New York City. Dr. Severance was born at De Ruyter, New York, on July 1, 1833. She studied with a physician for three years and then went to New York City where she received her medical degree in the year 1858.

DR. NEWELL SILL JENKINS, an American dentist, died recently in Havre, France, at the age of 78 years. Dr. Jenkins was born on Cape Cod, Massachusetts. He practised for 40 years in Germany and for five in France. Dr. Jenkins invented the porcelain method of filling teeth.

# The Boston Medical and Surgical Journal

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## Original Articles.

### THE ARMY TUBERCULOSIS PROBLEM AS SEEN IN MASSACHUSETTS.

By JOHN B. HAWES, 2ND, M.D., BOSTON.

ACCORDING to the latest figures that I have been able to obtain, dated May 19, 1919, there were 1604 Massachusetts men during the years 1917, 1918, and part of 1919, either rejected under the Selective Service law of the draft or discharged from the various camps, on account of tuberculosis. In order to get information as to how much of a problem, as far as the State of Massachusetts was concerned, there existed in regard to these men, I made detailed personal inquiry of each of the local boards of health throughout the State. The State Department of Health has confirmed the figures thus obtained, while from the Massachusetts Red Cross I have received further help; and finally, from the office of the Surgeon General at Washington, I have received additional figures. From various private sanatoria, and other institutions, I have obtained facts bearing on the case. My own investigations do not cover the entire State as sufficient time has not yet elapsed to allow of the collection of up-to-date figures in every locality. I have, however, fairly accurate knowledge from all the cities of Massachusetts, and eleven of the largest

towns, amounting to over 90% of the total population.

From this group of towns and cities, there were 1566 men rejected by local draft boards, concerning whom I have some information. Many of these men, of course, were known to be tuberculous by local authorities before they were drafted, and their rejection was but a matter of form; a considerable number, however, were new cases. There were 491 who were definitely stamped as cases of tuberculosis by local draft boards, the remainder being classified as suspicious, sufficiently so to call for their rejection. At the present time there are 548 out of these 1566 men concerning whom local authorities can give no information. These men have either left the State, or have gone to some other locality, or, as is more apt to be the case, there has been no thorough or energetic search to find out what has become of them. One hundred and ten of the original number have died. Of 622 men, concerning whom I have fairly definite information, 500, something over 80%, are working and apparently in good condition. 431 of these are under supervision by local authorities; there are 28 who are known to be working and in poor condition, and 43 are at the various sanatoria,—state, county, and municipal. I have been able to discover only 42 Massachusetts men who have been discharged from the service

on account of tuberculosi. Of these 42, 29 are under supervision, either at home or in local or private sanatoria, and 11 are in state sanatoria. Here then is a group of 1566 men of whom 491 (30%) are definitely called tuberculous, 548 (35%) have disappeared, while the others are called "suspicious cases."

In looking over these figures I at once asked myself the questions, "What constitutes a *war* tuberculosis problem from the point of view of the State and is a *war* tuberculosis problem in any way different from a *peace* tuberculosis problem?" I cannot see that it is. The war with its wholesale examination of men coming under the draft age has undoubtedly called to our attention many hitherto undiscovered tuberculosis cases, latent or active. It has done this in the same way that any survey properly carried out would do; in Massachusetts the results of the surveys of Barnstable County and of the cities of New Bedford and Cambridge, as well as the intensive work in Framingham, have shown that there exists, and probably always will exist, a certain number of cases of tuberculosis which were hitherto unknown. I cannot see that the discovery of patients, the results of an examination carried on as a war measure, in any way differs from the results of similar work carried on in peace time or by civilian authorities.

As far as the men discharged from the Army for tuberculosis are concerned, here again, except in the comparatively few cases handled by the War Risk Insurance Bureau, the State of Massachusetts has little if anything to do with the matter. Such men are automatically sent to Fort Bayard or to some other Army sanatorium and are kept there until their future is assured one way or another. Soldiers coming under the War Risk Insurance Bureau have been handled so simply and so easily in Massachusetts as to constitute no problem whatever. In a talk two days ago with the chief of the Massachusetts Red Cross I was given definite assurance, and permission to quote the statement, that from the point of view of the Red Cross in Massachusetts there has not been the slightest difficulty in handling the tuberculous soldiers or their families coming under the supervision of that organization. Some time ago I assured the Red Cross authorities that I would guarantee to place in some suitable institution within 24 hours notice any patient

they might ask me to handle. I have had no difficulty in so doing.

There are, however, certain situations which have arisen as a result of the war which we did not realize to have existed before. For instance, the Red Cross assured me that the chief problem it had to meet as far as tuberculosis was concerned was not the question of available beds in sanatoria or hospitals for their patients, but how to get the knowledge to local authorities, whether boards of health or Red Cross representatives, as to how to take advantage of these vacant beds and of other means of disposal already available. It has certainly impressed on me, for instance, that it is important for any State as a part of its method of handling tuberculosis to publish a bulletin at least once a year, and to see that such bulletin receives the widest publicity and is couched in the simplest and plainest language concerning the facilities not only for diagnosis and treatment, but for the disposal of tuberculous patients within its borders. I thought that we had sent out such bulletins often enough and I felt sure that the majority of physicians, and that certainly all boards of health knew how to get a patient into a state sanatorium, or at least knew how to get a patient into a local institution, or that they certainly knew where to apply for such information. I have come to realize, however, from my experience in the past year that I was mistaken, and that nothing along this line must be taken for granted. This is one point, and not a minor one, which may be called a war tuberculosis problem that awaits solution in Massachusetts.

In the figures which I have already given I noted with interest and, I must say, with disappointment the large number of men rejected under the draft classified as a result of my own investigations as "unknown," "disappeared," "left the state," or "removed." Here is another war tuberculosis problem. It ought *not* to be as simple as it apparently is, for a man who has been classified as tuberculous, or a tuberculosis suspect, so utterly to disappear that no trace of him, from the health point of view, is left behind. This, I feel, is a very definite problem. I believe the time is coming when each local board of health must make a yearly survey of the community of which it is in charge and give an adequate and satisfactory accounting of the present condition and the disposal of the cases of tuberculosis in its



midst. Such a regulation, with a proper penalty clause attached, would, I feel sure, have a very salutary effect, particularly on certain communities who pride themselves on being so healthy that they have no tuberculosis.

There is one problem, however, which the war has brought out which I feel must be met by every state and which affects every one of us. This problem is to find out how many of these men rejected in the draft, and discharged from the Army on account of tuberculosis, who at the present time are definitely stamped as having tuberculosis, or, which is perhaps worse, as *suspected* of having tuberculosis, really have that disease in the clinical sense. This I feel is a really important problem.

Two or three weeks ago I was asked to see a man in the Out-Patient Department of the Massachusetts General Hospital. He was 45 years old, a boiler maker, weighing nearly 200 pounds and looked the picture of health. He had a wife and five children and lived in a nearby city. He was taken with influenza while in service in the Navy in Ireland last October. During this time he had several copious hemorrhages. As soon as transportation could be arranged he was sent to the Navy tuberculosis sanatorium at Las Animas, Colorado; from there he had recently been sent back to his home in Massachusetts, and directed to apply to the Vocational Training Board in Boston for further help. He was examined by this board and was declared still to have active tuberculosis, and was told to go back to Colorado. It was at this stage that he saw me. According to the x-ray examination taken at the Massachusetts General Hospital there was no evidence of tuberculosis in the man's lungs; his temperature and pulse, taken for a week at home, were normal; sputum examinations were, and had been always, repeatedly negative, and I personally could find nothing wrong with his lungs at any examination. I advised him to go back to work, and to keep under observation once a month, which he has done. There are many such cases as this in Massachusetts. I fully realize that the standards of diagnosis for tuberculosis, as far as the Army is concerned, must be and should be stricter perhaps than those we employ in civil life. A man may be discharged from the Army on a diagnosis based on the x-ray examination alone, and a man may be discharged for a slight hemorrhage which may or may not be due to tuberculosis.

The Army could and should afford to take no chances.

I do feel, however, that the real tuberculosis problem which we have in the State of Massachusetts is not merely the looking up of those cases who have been classified as having disappeared or removed or unknown; it is not merely seeing that in the future every local board of health, and every physician, and every agent in the State dealing with tuberculosis, has accurate, up-to-date knowledge of the facilities at his disposal, but that our real problem which the war has given us is to find out how many of these men discharged from the Army, or rejected in the draft, on account of tuberculosis, really have that disease, and of more importance still, to formulate our standards so that there will be in the future a clear and definite understanding as to what constitutes active, pulmonary tuberculosis from the state and board of health point of view.

In a recent letter to a member of this Society, General Edwards, commanding officer of the 26th Massachusetts Division, in a reply to a question as to how much of a tuberculosis problem he had with his men in France, replied definitely that he had no tuberculosis problem. The Red Cross has assured me that they have had no tuberculosis problem. From the point of view of a state health officer dealing with tuberculosis, I can state that Massachusetts has no tuberculosis problem, as far as handling and disposing of the individual case is concerned. I do feel, however, that the war has emphasized and called to our attention the problem which we already had with us, as to how best to come to some practical and sane conclusions and to formulate definite standards in regard to tuberculosis, its diagnosis, and treatment. This it seems to me is the real Massachusetts war tuberculosis problem.

#### THE PHYSIOLOGIC BASIS OF THE COMMON GASTROINTESTINAL SYNDROMES FOUND IN PULMONARY TUBERCULOSIS.\*

By FRANCIS MARION POTTINGER, A.M., M.D., LL.D.,  
MONROVIA, CALIF.

IN discussing the relationship between inflammation of the lungs and altered function in the gastrointestinal tract, it is necessary to re-

\*Read before the American Gastro-Enterological Association, June, 1919.

call the embryology of these structures; for this gives us a basis for understanding the manner in which they are related through the visceral nerves.

The respiratory system is formed from a diverticulum from the gastrointestinal canal, and therefore carries with it the innervation of the mother structure, the same as the liver, pancreas and body of the bladder, which likewise have the same origin.

This embryological origin gives to the lung the same double innervation as that possessed by the intestinal tract. All smooth musculature and all secreting glands belonging to the lungs and bronchi are activated the same as the stomach and intestines (except the sphincters) by the vagus nerve, which belongs to the parasympathetic division of the vegetative system; likewise all, except the sphincters, are inhibited by the sympathetics.

When the pulmonary structures are inflamed, sensory nerves belonging to both of these systems are irritated and result in reflex action. During the stage of toxemia the cells of the entire nervous system also are irritated by the toxins. Toxins express themselves, peripherally, largely through the sympathetic nerves and in this manner produce a general inhibition of action throughout the gastrointestinal tract, decreasing the secretion, and relaxing the muscle of the walls. It may be that there is also an action of the toxins directly upon the muscle cells which interferes with their normal rhythm. The common symptoms on the part of the gastrointestinal tract during toxemia are those of decreased motility and decreased secretion—hypomotility, hypochlorhydria and constipation due to lessened secretion and lessened peristaltic action. This is common in all acute infections accompanied by marked toxemia.

The sensory sympathetics supplying the lung mediate with the spinal nerves in the cervical segments of the cord and produce reflex spasm of the muscles supplied by the motor nerves, and reflex pain in the tissues supplied by the sensory nerves, and, if the process becomes chronic, trophic changes in the skin, subcutaneous tissue and muscles supplied by both motor and sensory nerves.

The sensory fibers of the pulmonary vagus (parasympathetics) mediate with other fibers of the vagus and with other parasympathetic nerves (7th and 9th cranial nerves) and with the 5th cranial nerve which stands in the same

relationship to the sensory fibers of the vagus as the spinal nerves do to the sympathetics.

It is through the vagus (parasympathetics) then that the reflexes take place which affect the gastrointestinal canal when the lung and bronchi are inflamed. This parasympathetic stimulation is the cause of all the common reflex functional disturbances in the gastrointestinal canal which result from pulmonary inflammation.

Before one can understand the reflex symptoms which arise from inflammation in any organ, he must first appreciate the fact that nerve cells in different individuals and in the same individual at different times show different degrees of irritability; and second, that a nerve cell will not discharge and produce action until the stimulus is *adequate*. In other words, nerve cells are able to withstand a certain amount of stimulation without producing action, and this amount varies in different individuals and in the same individual under different circumstances. This accounts for the variability of symptoms as noted in a given disease, a fact which has always made diagnosis difficult. The diagnostician must remember when studying symptoms, that a given stimulus *has a tendency* to produce such and such an action but that this action may not occur because the stimulus may not be *adequate* to discharge the nerve cells upon which the action depends. A given stimulus might be able to produce syndromes in several systems of the body, or several syndromes in one system; yet one or more of these might fail to be present.

When the lung is inflamed the sensory fibers of the pulmonary branches of the vagus are irritated, and stimuli are carried to the sensory nucleus of the vagus in the medulla whence they are transferred to other neurons with which they mediate, *viz.*, vegetative fibers of the 7th, 9th, and 10th cranial nerves and somatic fibers of the 5th cranial nerve.

When mediation takes place with the 5th, 7th, and 9th cranial nerves, reflex action results mainly in an increased secretion and an increased irritability of the nasal and oral cavities, the pharynx, salivary, and lachrymal glands; in vasomotor disturbance in the cheeks and tongue; in trophic change in the tongue, which at times causes it, when protruded, to turn toward the affected side; and in pain expressed in the sensory neurons of the 5th cranial nerve (headache).

When mediation takes place in other portions of the vagus nerve, reflex action may result in any tissue which this nerve supplies, such as the larynx and pharynx, the bronchi, heart, upper portion of the gastrointestinal canal, liver and gall ducts, and pancreas.

Reflex stimulation, if *adequate*, produces the action which normally belongs to vagus stimulation in these structures,—an increased tonus in the muscles and an increased glandular secretion.

It is now evident that if stimuli which course centralward over the sensory neurons of the pulmonary vagus are transmitted to the efferent motor neurons of the vagus which supply the gastrointestinal canal, that they will have a *tendency*, reflexly, to cause an increased tonus in the musculature and an increased secretion in the glands. This is what we find clinically when the pulmonary tissue is inflamed in such chronic diseases as pulmonary tuberculosis. The “so-called” functional disturbances on the part of the gastrointestinal canal, which are so common in pulmonary tuberculosis, are nearly all of this type.

Variability characterizes functional disturbances. These symptoms may be present at one time and not at another. Unless one is familiar with this characteristic he cannot fully appreciate the gastrointestinal symptoms in pulmonary tuberculosis.

The common syndromes on the part of the gastrointestinal tract which are indicative of a preponderating vagus stimulation and which often result from reflex stimuli arising in other organs which are the seat of inflammation are nausea, vomiting, hyperchlorhydria, gastric hypermotility, colicky pains, spastic conditions in the intestines, notably spastic constipation, colitis, diarrhea, and intestinal stasis.

This group of functional disturbances makes up a considerable proportion of the symptoms on the part of the gastrointestinal tract of which patients suffering from early active or chronic semi-quiescent tuberculosis complain, and sends the patient to the gastroenterologist as often, if not more often, than to the specialist in disease of the chest. In fact, the reflex symptoms which are caused by clinical tuberculosis before the advent of marked toxemia, and productive cough, and during the stage of semi-quiescence are practically all expressed reflexly through the vagus in systems other than

the lower respiratory; in the larynx as irritation and cough; in the heart as an inhibiting effect producing instability; and in the gastrointestinal canal in the form of the syndromes above mentioned.

These symptoms may be caused by conditions in which the vagus nerve cells are hyperirritable (vago-tonia); by conditions which produce a marked stimulation of the vagus or a decreased stimulation of the sympathetics; by direct irritation of the nerve cells lying in the walls of the stomach and intestine; by reflex action in one part of the intestine, the stimulus coming from another part; or reflexly from inflammation in other organs. The most common sources of reflexes coming from without the intestinal walls, in my experience, are the appendix, gall bladder, lung, and eye.

It can be stated as a rule that functional disturbances on the part of the stomach and intestinal tract are more commonly an expression of reflex action from some other organ than from a disease of the tube itself; and when the syndromes here mentioned are present, the appendix, gall bladder, and lungs should be carefully examined for the presence of disease, and eye strain should be considered. One must not forget, however, that so-called nervous individuals (vago-tonics) are also prone to show this same picture of functional disturbance. The expression of “nervousness” in the gastrointestinal canal is predominantly that of increased vagus stimulation. When vago-tonics suffer from a pulmonary tuberculosis or a chronically inflamed appendix, or a disease of the gall bladder, then the symptoms on the part of the digestive system which result from vagus stimulation are prone to be very much exaggerated.

In order to understand what functional symptoms on the part of the digestive system are prone to manifest themselves in a patient suffering from tuberculosis, it is necessary first to know the nervous, the physical, and the psychological condition of that patient before he suffered from pulmonary tuberculosis; to know whether he previously suffered from any particular type of digestive disturbance; and to know what other complications may be present. It is also necessary to make a distinction between active pulmonary tuberculosis with marked toxemia and the type of the disease when toxemia is not prominent.

This is evident from the fact that reflex symptoms do not arise except as the stimulus

causing the reflex is sufficient to overcome the action of opposing nerves. When nerve cells are in different degrees of irritability, the strength of the stimulus necessary for their discharge will vary greatly. As long as the force of the sympathetic neurons in the intestinal tract is equal to or approaches the force of the neurons of the vagus nerve (parasympathetics) no disturbance in motility or secretion will take place, and normal function will exist; but just as soon as the force in one system overbalances the other, symptoms will arise.

When the pulmonary parenchyma is inflamed, as it is in tuberculosis, the sensory nerve endings of the pulmonary branches of the vagus nerve are irritated. This stimulus is carried to the medulla, where it is transmitted to motor neurons, which produce reflexes in structures supplied by them. Among the nerves involved are the motor fibers of the vagus which supply the stomach and intestine. This stimulus has a tendency to produce action in all the motor neurons to which it is transferred; and when it is adequate to overcome all opposing forces acting upon the sympathetics, it produces parasympathetic syndromes such as are mentioned below.

Whether a reflex gastric hypersecretion or hypermotility (increased muscle tonus), or a reflex intestinal hypersecretion or hypermotility (increased muscle tonus) will occur depends upon whether the stimulus arising in the inflamed organ and transmitted to the musculature and secreting glands of the stomach and intestine through the vagus is sufficiently strong to overcome the opposing inhibitory action of the sympathetic nerves supplying those tissues. This will depend also, to a large extent, upon the natural characteristics and tendencies of the patient. That the stimulus is adequate in a large proportion of instances is evident from the frequency with which patients afflicted with pulmonary tuberculosis suffer from reflex nausea, vomiting, hyperchlorhydria, spastic constipation, colitis, intestinal stasis, and colicky pains. These syndromes are common in patients who were free from them prior to their clinical tuberculosis and are often rendered more annoying in those instances where they were previously present. I have seen hyperchlorhydria in many instances during the high fever accompanying cavity formation. Not infrequently have I seen a relative bradycardia at the same time. These symptoms can only be inter-

preted as being a result of reflex stimulation of the vagus from inflammation in the lung, coming as they do during severe toxemia, which stimulates the sympathetics, depressing gastric secretion, and produces an accelerating influence upon the heart. Nausea and vomiting, which are often present at these times, are also frequently of reflex origin. These reflex relationships I have discussed quite fully in previous communications.<sup>1, 2</sup>

A few words in explanation of the reflex nature of these syndromes may not be out of place. I do not wish to be understood as maintaining that these syndromes when present in pulmonary tuberculosis are always a reflex from the lung, for I realize that there are other causes operating; but I desire to emphasize that the inflammation in the lung produces stimuli which have a tendency to produce them. *Nausea and vomiting*, found in pulmonary tuberculosis, are undoubtedly often of reflex origin: being an expression of increased muscular tonus in the gastric walls. These patients also, at times, show more than ordinary degrees of hunger. Carlson has shown that this phenomenon is due to increased gastric motility.

*Colicky pains* are very common during the course of pulmonary tuberculosis. Unless there be a mechanical obstruction these are usually due to areas of spasticity in the intestine which interfere with the onward movement of the gas, causing it to accumulate, and distend the gut and cause the pain. When the intestinal musculature is in a state of increased tonus, different areas of the gut show different degrees of irritability, a condition which favors constriction at intervals and permits of the accumulation of gas with distention of the bowel proximal to the constriction.

*Spastic constipation* often results from reflexly increased tonus in the musculature of the colon, the stimulus causing the reflex emanating from the lung. This form of constipation is usually accompanied by colicky pains. It is due to the same cause, being an expression of the same increased muscle tonus (hypermotility).

*Colitis* in tuberculosis has the same reflex cause as the foregoing phenomena. The vagus, when stimulated, not only causes an increased muscle tonus leading to a hypermotility, but also an increased secretion in the intestinal glands.

The reflex type of *intestinal stasis* is caused by a retardation of the intestinal contents in

their progress through the canal as a result of spastic conditions in the bowel.

If we substitute inflammation in the appendix and the sensory fibers of the vagus which supply the appendix in one case, and inflammation of the gall bladder and the sensory fibers of the vagus which supply it in the other, for the inflammation of the pulmonary tissue and the sensory fibers of the vagus which supply it, we have the mechanism which explains the gastrointestinal symptoms in appendicitis and inflammation of the gall bladder. Then, further, if we will substitute the stimuli which arise from eye strain, and the sensory fibers of the 5th cranial nerve which mediate with the motor neurons of the vagus, for the stimuli arising from inflamed pulmonary tissue and the sensory fibers of the pulmonary vagus, we will have an explanation of the reflex mechanism through which eye strain produces symptoms on the part of the gastrointestinal canal.

Through an understanding of visceral nerves and the relationships which are maintained by the various viscera through them, reflex functional disturbances are stripped of their former mystery and placed on an understandable basis.

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# LOSS OF SIGHT FROM RETROBULBAR NEURITIS DUE TO POSTERIOR ACCESSORY SINUS DISEASE. WITH REPORT OF 17 CASES.\*

BY LEON E. WHITE, M.D., BOSTON.

(Concluded from page 391.)

CASE 11. R. M., aged 45, was referred on April 18, 1918, by Dr. William J. Daly, with diagnosis of axial neuritis left with large central scotoma for colors. History of fair health and ability to work. Patient has had pain across the forehead and through the eyes for past 3 weeks. Expectored a little bloody mucus in the morning. Eight months ago the sight of the left eye commenced to fail and he visited the infirmary. His fundus was examined at that time by Dr. Worthen and reported as practically normal: vision 20/200. The fields were slightly contracted; no color scotoma. With the onset of pain the vision in the left

eye has been much worse, everything now being blurry. In the region of the left posterior ethmoid there was considerable soft polypoid tissue, bleeding freely at touch. A most interesting phenomenon was noted: after thoroughly cocaineizing this region the slightest pressure with a cotton swab caused intense pain. Again this region was cocaineized, yet the pain was in no wise lessened. This led me to suspect some more serious trouble than merely an infection in these cells, so I sent the patient to the Infirmary for further examination. The x-ray by Dr. Liebman showed marked erosion in the sella turcica region; clinoid processes obliterated; ethmoids and sphenoids moderately obscured. This finding, of course, meant a malignant growth, so nothing was attempted in an operative way. The Wassermann and neurological examinations were both negative. After being under observation 6 days he was discharged unrelieved. One week later the patient died rather suddenly and his family physician, Dr. G. W. Blaisdell of Manchester, Mass., wrote as follows:

"I saw Mr. M— on May 3d, at 2 P.M. He had had headache for the previous twenty-four hours. The headache was general all over the head. Temperature and pulse at that time normal. He was rational and answered all my questions. There was a slight protrusion of the left eyeball. The eye was painful to touch. All reflexes were normal. I saw him again at seven o'clock. He was not as bright mentally. The left pupil failed to react to light. I saw him the next morning at five o'clock. He was then passing into coma. The reflexes of his legs even then were about normal. He died suddenly about two hours from that time, dying very easily without a struggle."

Dr. P. E. Meltzer of the Infirmary kindly made the autopsy for me. His report is as follows:

"The usual technic was observed and calvarium was removed. Hemorrhagic areas were noted in the parietal region of the cerebral hemispheres suggesting meningitis. No free pus or exudate was seen but the sulci were infiltrated. On elevating the frontal pole, the most striking condition was noticed. Projecting upward from the sella turcica was a tumor about the size of an English walnut, which, as it projected upward, made quite an impression on the under surface of the brain just anterior to

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the chiasm. It was slightly adherent to the surface of the brain, but by careful manipulation it apparently separated intact and appeared pedunculated from the body of the sphenoid, in the pituitary region. The cranial nerves, particularly the optic, were removed for sections. In order to remove the tumor, it was necessary to remove practically the anterior and middle fossae of the base of the skull. This was done but the cellular condition of the nasal walls made this difficult. By carefully chiseling through the cribriform plate, the roof of the orbits, the lesser and greater wings of sphenoid and posteriorly through the basilar process, a wedge shaped portion of base of skull was removed, without disturbing materially the relations. The tumor and neighboring structures, posterior ethmoidal cells, were practically intact. The brain and specimen were placed in 10% formalin for purposes of hardening. Dissection later proved that the body of the sphenoid was practically entirely eroded."

Dr. Verhoeff, who examined the brain and new growth, reported as follows:

"Pathological diagnosis: Large round cell sarcoma of sphenoid bone and hypophysis. Streptococcus meningitis.

"The specimens consist of the brain and the body of the sphenoid bone together with the posterior portions of the ethmoids, including the optic canals.

"The sphenoid bone is almost completely pervaded by a tumor growth which has either completely broken down or rendered the bony structure friable. The sphenoid sinus is filled by the growth, which has also broken through into the pharynx over a small area. The growth has extended into and greatly enlarged the pituitary body, but the capsule of the latter is still intact towards the brain. The chiasm is pressed upon by the enlarged pituitary body but has not been invaded by the growth. The brain shows the typical picture of a diffuse purulent lepto-meningitis.

"Histological examination: The meninges show diffuse purulent infiltration containing an abundance of streptococci. Sections of a portion of the growth removed from the sphenoid sinus show it to be a large round cell sarcoma. The fixation is not sufficiently good to permit special stains being used.

"Sections of the pituitary body show that it has been almost completely destroyed by the

growth, only a few parenchyma cells remaining here and there.

"Sections of the optic nerves and tracts, prepared by the Merch and Weigert methods, show no evidences of atrophy or degeneration."

"As I remember the case, there was a central scotoma in one or both eyes. This is not inconsistent with the fact that I found no degeneration in the optic nerves, because there may have been simply functional blocking, capable of recovery could the pressure have been removed."

CASE 12. Mr. C. T. K., aged 49, referred by Dr. F. E. Cheney on July 18, 1918, with diagnosis of unilateral retrobulbar neuritis of some months' standing. He has had considerable secretion in nose and throat for years. Four months ago, following an unusually severe cold, the vision in the left eye suddenly became very poor and there was severe pain through the head. Then something seemed to break in the back of his nose and for a few days there was an offensive bloody discharge, followed by complete relief from the pain. His vision, however, never completely returned. Dr. Cheney's report is as follows:

"An ophthalmoscopic examination showed a marked swelling of the left disc, about 3.D.—the borders completely obliterated, retinal veins moderately full and tortuous, and obscured at disc borders. There were a number of glistening cholesteric-like spots on the disc and the appearance of the disc as a whole did not suggest a recent inflammatory process. The borders of the right disc were completely obliterated and the disc elevation was about 1.D. The fields of vision were not contracted.  
v.o.c.e +50 cyl.ax 0=1.v.o.s.c.+50=50 cyl.ax.0  
=0.7

"As I have said, the appearance of the left disc especially suggested an old rather than a very recent inflammation and the trouble probably existed before his cold and nasal discharge in March."

The Wassermann was negative, as was also the neurological examination by Dr. W. E. Paul. Patient does not use alcohol or tobacco to excess. A posterior deviation of the septum crowded the left middle turbinate so as to obstruct the sphenoids and posterior ethmoids. The tissues in this region were distinctly boggy and mucopurulent secretion was seen about the middle

turbinate. The x-ray plates made by Dr. Lieberman showed "Ethmoids: left anterior and posterior obscured. Antrum: right obscured. Sphenoidal sinuses: both rather hazy." On July 22, 1918, about 4 months after the onset of the neuritis, I removed the left middle turbinate and opened a posterior ethmoid cell, anterior to the sphenoid, which at first was thought to be a rather small, shallow sphenoid, but on further examination an opening leading into a good sized sphenoid was found. The sphenoid contained pus, was some 10 mm. in antero-posterior diameter with a thick anterior wall and soft tissue on the floor. There has been a gradual improvement in the vision. The blurriness no longer exists. Three months after the operation Dr. Cheney found that vision in right eye was still normal and an improvement of 1/10 in the left, but there was no appreciable change in appearance of discs and he thinks there may not be for a considerable time. Five months after the first operation the opening into the sphenoid, which had become quite small, was enlarged. This case is still under treatment as the fundi are not yet normal.

CASE 13. Miss E.A.H., 49, was referred by Dr. Thompson at the Infirmary on December 16, 1918, with diagnosis of bilateral optic neuritis. History: Four months ago, vision, which had always been poor, due to extreme myopia, began to be much worse. Has had severe pain in head for past fifteen years, but much worse the last six months and constant for the past four weeks, causing complete disability. Has sensation of severe pressure within the head. Six months ago commenced to expectorate a thick mucus streaked with pus, and since that time has had intervals of marked temporary loss of vision. Pupils small and dilate easily; both discs irregular in outline and white on temporal sides, probably due to extreme physiological cupping of both nerve heads. Nasal side of discs slightly accentuated. There was a marked deflection of the septum and hypertrophied middle turbinates. Physical, dental, neurological, x-ray, and Wassermann examinations all negative. Vision 20/200 both. On January 3, 1919, the septum was resected, the right middle turbinate removed and the right sphenoid opened. It was very large and filled with a thick gelatinous secretion. For several weeks the patient was entirely free from headaches and there was a

slight improvement in vision, i.e., from 20/200 to 20/100, and enlargement of the visual fields. Then she complained of a feeling of discomfort with some pain on the left side, apparently above and behind the eye and extending to back of neck. On January 31st her left middle turbinate was removed as well as the anterior wall of the left sphenoid. Reddened areas were found in the sphenoid but only a small amount of mucus. This case is still under treatment.

CASE 14. A. R., aged 5, was referred by Dr. Spalding at the Infirmary on January 3, 1919, with diagnosis of bilateral neuro-retinitis. Child had influenza four weeks ago, and for the past two weeks has acted as if he could not see; complained of headache and had some vomiting. The fundi showed optic neuritis with stellate exudate changes in the macular region and dilated veins. Patient apparently does not even perceive light. Neurological, physical, x-ray, and Wassermann examinations all negative. There was a slight deviation of the septum high up, and both middle turbinates were greatly swollen, blocking the posterior ethmoids. For a week the turbinates were cocaineized and the nose irrigated with a hot saline solution, as I hesitated to operate on such a young child. As there was no sign of a return of the vision both middle turbinates were removed and the posterior ethmoids cleaned out,—a difficult procedure I assure you, in such a small nose. The following notes from the Infirmary record show the progress of the case from day to day:

January 12. (Two days after the operation). Lumbar puncture negative. Fundi show no change except possibly a more grayish tint to disc.

January 13th. Patient beginning to note shadows in front of him. Says he sees the light.

January 15th. Some improvement in vision.

January 17. Patient walks about the room, avoiding large objects. Recognizes a watch. Nerve heads appear slightly less blurred.

January 20th. Vision improved; counts fingers at 4 feet.

January 27th. Less edema of retina. Still some swelling of optic nerve and white exudate in macula region but definitely less marked. Counts fingers at 20 feet.

February 13th. Improvement in fundi. Less edema of nerve head. Exudate in macula region definitely less.

February 15th. Vessels of fundi of normal size.

February 18th. Discharged. Disc outline not distinctly made out. Some pallor of discs. White patches in macula region much smaller. Counts fingers at 20 feet and picks up pins from floor. Vision apparently normal.

CASE 15. J. K., 37, was referred to me from the Eye Clinic of the Infirmary on February 6, 1919, with diagnosis of bilateral papillitis. History: A month previously, while at work, his right eye was struck with a fragment of eye-glass or the piece of steel that broke the glass. Vision for fingers at 1 foot left, 20/40 right. Dr. Quackenboss saw the patient on February 14th, 1919, and noted a marked double optic neuritis. Both discs were indistinct in outline, the left more so than the right, but no swelling made out. Physical, neurological, and Wassermann examinations negative. X-ray showed right antrum and posterior ethmoids obscured. Sella turcica unusually large in anteroposterior diameter but probably not pathological. The left middle turbinate was removed and the sphenoid and posterior ethmoid opened. The sphenoid was filled with pus under some little pressure. The patient developed an acute frontal sinusitis ten days after the operation, but the eye conditions improved somewhat. Two weeks after the operation Dr. Quackenboss noted the left disc stood out more clearly and the edges more distinct. On March 24th the discs still showed some slight hyperemia. Vision right 20/20, left fingers at 2 feet. Question of malingering as the patient was contemplating bringing suit for damages against the company he worked for when he had his glasses shattered. A secondary operation was advised, but refused.

CASE 16. S. D., 40, was referred by Dr. E. T. Easton with diagnosis of unilateral optic atrophy. History: About 3 years ago he noticed that there was a constantly present blue spot in front of the right eye and that everything was blurry. Under constitutional treatment this cleared up in about three weeks and for a year the vision was normal. Then there was a recurrence of the trouble and in spite of treatment by specialists near his home and at the New York Eye and Ear Infirmary, vision has been going from bad to worse. When seen by Dr. Easton on February 12, 1918, the vision

in the right eye was 20/50; pupil rather dilated but reacted well; disc slightly pale; fundus otherwise normal; central scotoma for red, green, and blue. When next seen by Dr. Easton on February 13, 1919, vision had dropped to 20/200. Patient was referred on his first visit to Dr. Easton to the Eye and Ear Infirmary and admitted as a house case on February 19, 1918. Diagnosis: Optic atrophy right. The x-ray of sinuses, Wassermann, and neurological examinations all negative. Patient was first seen by me on February 20, 1919, *i.e.*, one year later. There was a marked deviation of the septum to the right and the middle turbinate was tightly wedged between it and the outer wall. Eight days later I removed his right middle turbinate, opened the sphenoid and posterior ethmoid. The mucous membrane lining these cavities was considerably thickened, quite evidently a case of hyperplasia. Two months after the operation Dr. Easton reported as follows: "Mr. D. shows improvement in vision in right eye from 20/200 to 20/100. The disc shows no increase in pallor."

CASE 17. Mrs. R. D., aged 31, was referred by Dr. Henry Hawkins on March 21, 1919, with diagnosis of bilateral retrobulbar neuritis; vision right 20/30, left 20/100; papillitis of each disc, general edema of retina. History: Frequent colds during past winter but vision not affected until six days ago when everything seemed foggy. This foggyiness has been getting worse and she complained of a blind spot in the center of her visual field. She has had considerable pain about the eye and back of neck extending down to the shoulder blades. Both middle turbinates were greatly hypertrophied, the left the most marked and especially obstructing the sphenoid. Immediate operation was advised. On the following morning the left middle turbinate was removed and the sphenoid and posterior ethmoid opened. The sphenoid was of enormous size, extending over an inch beyond the median line to the other side. The lining was boggy and the posterior ethmoid cell large and high. The sphenoid was irrigated daily with a hot saline solution. The discomfort about the eye and the pain in the head was immediately relieved. Vision returned rapidly so that on April 10th, 3 weeks after the operation, Dr. Hawkins reported: "Right eye with proper correction



20/20, left 20/30; fundi little change from normal conditions."

Two weeks later vision 20/20 both.

This last case illustrates how quickly results are obtained by prompt operative interference, and I believe is the method of procedure to be followed in all obscure cases. Is it not infinitely better to open the posterior accessory sinuses promptly, sometimes perhaps unnecessarily, than to allow one of these cases to become permanently blind through neglect?

#### SUMMARY.

Of the 17 cases here reported, 12 were not operated upon (Cases 1 and 11). In one the eye remained permanently blind, while in the other the patient died from a sarcoma.

Of the 15 operative cases, all but one improved (Case 10). In this case the eye had been practically blind some months and the operation was undertaken to determine what effect, if any, the opening of the sphenoid would have on the dilated veins of the fundus.

Normal vision was obtained in seven (Cases 2, 3, 5, 7, 8, 9, 17).

There was marked improvement in three (Cases 6, 12, 14), but some optic atrophy.

Only slight improvement in four (Cases 4, 13, 15, 16), this being due to the chronic nature of the disease and the delay in operating. In all these an early operation would have saved much more of the vision.

The toxemia from the pus, found in 7 cases, seemed the chief factor (Cases 1, 4, 9, 10, 12, 15).

In 8, hyperplasia appeared the predominating lesion (Cases 2, 3, 5, 6, 7, 8, 16, 17).

In two cases pressure apparently played the leading rôle (11, 14).

In seven, the nasal examination was negative (Cases 2, 4, 5, 7, 8, 9, 10).

In six cases the x-ray findings were positive (Cases 2, 3, 4, 11, 12, 15). Negative findings, however, by no means contra-indicate an operation.

The middle turbinate was removed in all the operated cases and the sphenoid opened in all but one (Case 3). The posterior ethmoid cell is at present opened as a matter of routine. Unless suspected of infection, the other ethmoid cells are not disturbed. The complete exenteration does not, in most cases, seem necessary. The Sluder technic of removing the middle tur-

binate and opening the sphenoid is followed. In practically all cases Wassermann and neurological examinations were made and the teeth investigated.

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## Clincal Department.

### NECROSIS OF THE INDEX FINGER FROM LYSOL: REPORT OF A CASE.

#### AN ARGUMENT FOR THE THOROUGH MIXING OF SUCH SOLUTIONS.

By HORACE K. SOWLES, M.D., BOSTON

CARBOLIC acid necrosis is a well recognized possibility, but the danger from concentrated solutions of lysol, although evident, is probably not quite as prominent in our minds. The manufacturers of lysol definitely state on their label that a 1% to 2% solution should be used, but I feel that many people do not bother to follow these directions or possibly fail to mix the concentrated lysol with the water, as in the following case which I wish to report.

H. J., male, 29, came to me on June 28 because of the condition of his right index finger. The patient states that about four days ago he noticed some soreness and redness at the base of the nail on the right index finger. During the next forty-eight hours he soaked the finger in lysol solution four times; average length of soak was perhaps fifteen or twenty minutes. Yesterday he noticed that the whole distal half of the finger seemed to be covered by a blister and the whole finger was very much swollen. The condition is worse today but not very painful.

On examination the finger shows marked swelling with redness about the base, which had a very sharp line of demarcation. The epidermis of the dorsal distal half of the finger is white and raised from the subcutaneous tissue. It looked as if it had been floated up by serum or pus, but on removing it the subcutaneous tissue was dry and necrotic. In fact, it had a typical "carbolic acid gangrene" in appearance.

The finger was cleansed with alcohol and a boracic ointment dressing applied. In the course of time there was a fairly extensive slough from the dorsum of the finger which involved the terminal joint. Now, at the end of five weeks, there is a small granulating area at the base of

the nail and very slight motion of the terminal phalanx. Undoubtedly the action of the terminal joint will be permanently impaired.

After careful questioning as to the method of soaking it was learned that the patient had taken a basin of water and poured in an indefinite amount of lysol. Then the hand was placed in the solution, palm upward, and soaked for fifteen or twenty minutes, the dorsum of the index finger apparently lying in the concentrated lysol which had settled to the bottom of the basin and had not been mixed with the water.

## Book Reviews.

*Pulmonary Tuberculosis.* By A. L. FISHBERG, M.D. New York: Lea & Febiger. 1919.

The reviewer notes with interest and with encouragement that a new edition of Dr. Fishberg's book has become necessary so soon after the first. It contains much new material that is of great interest and value, and although its weight,—something over four pounds,—makes it difficult to hold, the excellence of the paper, clearness of the type, and the good arrangement in general, more than make up for its bulkiness.

Dr. Fishberg is radical in many of his frankly expressed views and opinions, but even if one cannot agree with many of them, it is stimulating and interesting to find a writer who comes out so definitely and clearly. In his introduction, for instance, he wisely calls attention to the fact that incipient does not mean curable tuberculosis and that advanced does not necessarily indicate a hopeless outlook. In a study of over 1,000 patients in Massachusetts sanatoria, the reviewer found to his surprise that there was a larger proportion of patients admitted in the moderately advanced stages of the disease who were doing well four or five years after their discharge, than of those in the incipient stage. Dr. Fishberg makes the statement that if all tuberculous persons would consent to hospitalization, available institutions would hardly accommodate 10%. If he means, and he doubtless does mean, all tuberculous persons in need of hospital or sanatorium treatment, the reviewer would doubt the truth of his statement, in Massachusetts at least. Indeed, when our county institutions, now in process of construction are finally opened, along with certain private and municipal hospitals and sanatoria, whose completion has been delayed by the war, Massachusetts will run a risk of having more beds for the tuberculous than can be filled. He states that careful home treatment is productive of practically the same immediate and ultimate results as institutional treatment and is less costly to the patient and

to the community. Again the reviewer would strongly object to this statement and is firm in his belief that the great majority of workers in the field of tuberculosis in this country and in Europe would agree with him, that sanatorium treatment, in the broad sense of the term, is the best method at our disposal of treating the average consumptive. His statement that home treatment is less costly to the patient than institutional treatment is another one which will not bear analysis. In Massachusetts State and County Institutions the cost per week is four dollars to those who can pay it, grading down to nothing for indigent cases; while at municipal hospitals there is rarely any charge.

The reviewer rather feels that Dr. Fishberg tends to belittle the dangers of bovine sources of infection and over emphasizes the possibility that such bovine infection may give a certain amount of immunity against infection from human sources.

His chapters on the signs and symptoms of tuberculosis are excellent, and his emphasis of the importance of constitutional signs and symptoms is of great value. Every general practitioner might well remember the following: "If there are no symptoms of constitutional toxemia, the patient may have been infected with tubercle bacilli, but he is not sick with a disease which needs special treatment, costly to the community and often ruinous to the patient or the family."

The reviewer has a constitutional objection to the word *phthisis* which is used in this volume to denote tuberculous disease in distinction from tuberculous infection. The two phrases, tuberculous infection and tuberculous disease present the same meaning and serve the same purpose in a rather better way than does the ugly sounding word *phthisis*.

The comparatively little danger that a normal, healthy adult runs from even intimate exposure to a consumptive is justly pointed out as well as the rarity of marital tuberculosis.

In his chapter on cough, the reviewer believes that he pays undue attention to the different varieties that exist and that the space devoted to this might well be condensed into one sentence; that there is no cough characteristic of tuberculosis and that all kinds of cough may exist. He advises that rectal temperature be used in place of temperature by mouth. There are many who do not believe that this is necessary or wise. He states that there is no active tuberculosis without fever. There are many observers including the reviewer, who believe that the combination of a rapid pulse and a sub-normal temperature constitutes a danger signal that cannot be disregarded. He repeatedly speaks of "hectic" fever. The majority of his readers will probably agree with the reviewer that "hectic" fever as well as "hectic flushes" are things of the past.

His chapter on hemoptysis, its pathology, causes and treatment, is excellent. It is rather a pity that he does not state definitely the amount of blood necessary to constitute a hemorrhage. An attempt has been made to do this in the "Diagnostic Standards," formulated for the purpose of the Framingham Tuberculosis Demonstration, in which the statement is made that "a hemorrhage amounting to at least a teaspoonful of clear blood is strongly suggestive of tuberculosis, but that any amount of expectorated blood should be investigated." He wisely emphasizes the fact that a hemorrhage, no matter how copious, rarely has any immediate serious consequences. He quotes the figures of Richard Cabot, who found that 34% of 3444 cases of so-called hemorrhage were due to heart disease. The reviewer believes that had Dr. Cabot had any such standard as the one mentioned above for the Framingham experiment, his proportion of cases due to heart disease would have been much lower and those due to tuberculosis much higher. Considerable space is devoted to hemoptysis of "nervous" origin and of "unknown" origin. Neither of these paragraphs adds much to the value of his book.

In physical examination a number of pages and ten cuts are devoted to Krönig's Isthmus. The reviewer is bold enough to recommend that in future editions reference to this isthmus be left out altogether, as, in his opinion, a vast amount of time has been wasted and a vast number of wrong deductions made by endeavoring to percuss out this area described by Krönig. One notes with distinct approval, however, that no mention is made of "consonating râles." For many years the reviewer has endeavored to find out exactly what a consonating râle is, without success. He wisely emphasizes the importance of the use of the whispered voice. His chapter on radiography is sane and sound; likewise, his conclusion, that the complement fixation test is not, as yet, of great value, is to be commended.

He sums up the subject of tuberculosis in infancy, in the advice to "think of tuberculosis in every case in which no other diagnosis can be made." He considers the subject of bronchial gland tuberculosis in children in detail and emphasizes the difficulty in the percussion of such glands. There is rather too much emphasis put upon the value of d'Espine's sign as denoting enlarged tuberculous glands rather than simply glands enlarged from any infection, acute or chronic.

His conclusion in regard to pneumothorax, that it is of value in only a very small proportion of cases, and likewise, that pulmonary syphilis is extremely rare, is in hearty accord with that of the reviewer.

There are many who would not agree with his conclusions as to the value of climatic treatment. His statement that "It can be stated without fear of meeting proofs to the contrary,

that on the whole, sanatoria do not show better lasting results than properly conducted home treatment." is one which, as mentioned earlier in this review, will not be accepted by the majority of tuberculosis workers. Statistics in regard to the value of home treatment are extremely difficult if not impossible to obtain, and the fact that so many patients relapse after a stay of a few months at a sanatorium, does not militate necessarily against the value of sanatorium treatment, but is, on the other hand, striking evidence of the fault of our whole system of handling tuberculosis which allows such relapses to take place. In the future, and indeed in some states in the present, sanatorium treatment will mean not only careful supervision in the institution, but also for months after the patient has left the sanatorium. Whether this supervision is at home or in a farm or industrial colony, is a comparatively minor detail.

His chapter on the diet is excellent, but in his chapter on drugs, one notes with considerable surprise that reference is made to the value and use of creosote and guaiacol by mouth and by inhalation, both of which nauseous combinations the reviewer imagined had been long since discarded, as certainly in Massachusetts they have been.

The book, despite these points with which the reviewer is not in accord, is stimulating and interesting and one that should prove of value to many.

*War Surgery of the Face. A Treatise on Plastic Restoration after Facial Injury.* By JOHN B. ROBERTS, A.M., M.D., F.A.C.S., Professor of Surgery in the University of Pennsylvania Graduate School of Medicine; Lecturer in the Civilian School of Plastic and Oral Surgery Established in Philadelphia by the Surgeon General U. S. A. Prepared at the Suggestion of the Subsection on Plastic and Oral Surgery Connected with the Office of the Surgeon-General. Illustrated with 256 Figures. New York: William Wood and Company, 1919.

Dr. Roberts' most excellent book of 200 pages is extremely interesting and most instructive.

"The possibility of correcting a hideous distortion of features or replacing a large section of the human face was realized inadequately until the great European War produced so many mutilations. The public at large and even a considerable number of members of the medical profession were unfamiliar with the advances made in plastic surgery. Military surgeons were soon confronted with problems with which they were unfamiliar; but they quickly used with ever increasing skill the reparative methods of Tagliacozzi, Szymonowski,

Nélaton, Wolfe, Lexer, Morestin, Esser, and other workers.

"The experiences of surgeons and oral surgeons in army and navy services of the divers nations at war have given rise to a valuable literature of both prosthetic and operative treatment of facial wounds. The author has endeavored to correlate the results of military and civil practice in traumatic surgery of the face, realizing that the fundamental principles of surgical science hold sway in both provinces."

It is fair to say that Dr. Roberts has succeeded entirely and completely in the object for which his book was planned. He deserves the thanks of the profession; and his book should be studied by every surgeon who has the least interest in plastic operations.

*Papers on Psychoanalysis.* By ERNEST JONES, M.D., M.R.C.P. Revised and Enlarged Edition. New York: William Wood & Co. 1919. PP. VIII+715.

This second edition of collected papers of Dr. Jones is a very welcome contribution to the growing importance of psychoanalysis, since the first edition of the book has been out of print for three years. The volume has been thoroughly revised and extended and twenty-one new chapters have been added. It is written with the usual dignity, scholarship, and clearness of all Dr. Jones' contributions and it ought to do much to neutralize some of the ignorant muckraking and arm-chair criticism, which seems to be the chief indoor sport of some physicians in their attitude towards the psychoanalytic movement.

The volume is divided into several parts, i.e., general papers, papers on dream analysis, papers on psychoanalytic treatment, papers on the clinical aspects of psychoanalysis, and finally papers on education and child study. It seems a pity that Dr. Jones did not include his interesting psychoanalytic study of Hamlet in this volume.

While the book is a bulky one and the papers were written at different periods of time and on different occasions, yet there is a remarkable unity in the collection. For the beginner in psychoanalysis as well as for the more advanced student who is interested in the fine details of its medical and cultural aspects, the volume can be highly recommended.

The chapter on the attitude of the physician toward the current conflicts and difficulties in the patient's life is one that ought to be read by all physicians. Since so many of the medical profession are called upon to advise their patients concerning neurotic difficulties which seem to arise out of the disappointments, sorrows, problems and anxieties of their every-day lives.

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## UNDERGRADUATE RESEARCH IN MEDICAL SCHOOLS.

AN investigation has been conducted by an undergraduate society of the University of Pennsylvania to determine the conditions under which undergraduate research work is being carried on in the principal medical schools of America. The purpose and results of this inquiry have been reported in a recent issue of *Science*.

The faculty of the University of Pennsylvania believes almost without exception in the educational value of scientific research among undergraduates. The problem of making it possible for students to have time to devote to research work in addition to the regular course is a difficult one. It is interesting to discover how it has been met by the leading medical institutions.

Five main questions have been asked of twenty-five medical schools: (1) Whether undergraduates are allowed to undertake research

in conjunction with their regular work; (2) whether means are taken by the faculty to encourage undergraduate research; (3) how many of the graduating classes have undertaken some research problem under the instruction of the faculty during their regular course of study; (4) whether the curriculum permits a student to substitute time spent on research, under direction of a member of the faculty, for hours in the regular course, required or elective; and (5) whether it is believed that undergraduate research is justified by its educational value to the student.

The answers received from the various medical schools are of considerable interest, in that they show the prevailing theoretical belief in the value of undergraduate research, and at the same time disclose the difficulties which are encountered in putting it into actual practice. A large proportion of medical schools permit undergraduates to undertake research in conjunction with their regular work. Twenty schools allow it, two are doubtful of its value, and only two forbid it. These figures show that within the last seven years the opposition has shrunk from thirty-two per cent. to nine per cent. Undergraduate research is permitted in the medical schools of the following universities: California, Cornell, Colorado, Harvard, Illinois, Johns Hopkins, Leland Stanford, McGill, Michigan, Minnesota, Mississippi, Oregon, Rush, Texas, Tulane, Virginia, Washington (St. Louis), Western Reserve, Wisconsin, and Yale. The University of Maryland and George Washington University are opposed to it, and the College of Physicians and Surgeons (Columbia) and the University of North Carolina are in doubt as to the wisdom of encouraging it.

The chief cause of objection to undergraduate medical research is the lack of time in the course. Various schools have made it possible in different ways. California, Colorado, Illinois, Harvard, Michigan, Washington, and Virginia encourage it by the personal advice and interest of members of the faculties; Texas, Michigan, and Tulane allow undergraduates to assist members of the teaching staff; Leland Stanford, Wisconsin, and Yale require a thesis for graduation; at Rush it is given credit towards a degree; Minnesota and Johns Hopkins offer elective courses in research. Some of the schools make it possible for undergraduates to have time to undertake

research by permitting students to substitute time spent in research for hours in the regular course; others reduce the hours of instruction to such a degree that enough free time is available.

The investigation made by the undergraduate medical society of the University of Pennsylvania has shown plainly that among the majority of medical schools undergraduate research is considered justifiable by its educational value. The fact that it has greatly increased since 1912 indicates the growing recognition of its importance and the determination of many medical schools to find some method by which it can be introduced into the undergraduate course.

### DISH WASHING AND THE SPREAD OF DISEASE.

THE importance of careful dish washing has been demonstrated by investigations carried on at army camps. There are two general methods of cleansing the eating utensils in the army,—one by which the dishes are washed in boiling water, the other by the "old line method," in which each soldier washes his own kit in the water used by his comrades. The results of an investigation of about 66,000 troops have been reported in a recent issue of the *American Journal of Public Health*.

Where the "old line method" was used, groups of about two hundred men used common water which was never boiling, but reached a temperature of from about 100 to 120 degrees F., the bacterial content of the dishwater becoming higher as successive men used it. At Camp Stuart both systems were in use, about one thousand men eating from tableware washed in boiling water, and nearly two thousand using the older method. During the influenza epidemic, these two systems were put to the test. In the first group, the influenza incidence was 46 per thousand and in the latter, about 298. These conditions have been still further emphasized by a comparison between the incidence of disease among the men in the Officers' Training School at Camp Lee, where the men were in close classrooms but had their dishes washed in boiling water, and at other schools which were held for the most part out of doors but used the individual dish washing method. The

rate of influenza infection was found to be five times greater in the latter group. Similar facts were reported from a comparison of 12,500 soldiers at Fortress Monroe and of 800 men at Langley Fields, which showed a ratio of four to one in favor of the former where boiling water was used. Lee Hall Balloon School is one of the two exceptions to this general rule. The comparison of a total number of 33,452 using boiling water and 32,642 using tepid water has shown 1710 and 8208 cases respectively.

This investigation has been carried further and its principles applied to civil life. In restaurants and stores the rate was found to be nine and thirteen per thousand among employees where boiling water was used, compared with 240 and 84 per thousand where the hand method was employed. It would be well if these facts could be remembered and their lesson more generally heeded.

### VITAL STATISTICS IN FRANCE IN WAR-TIME.

IN a previous issue of the JOURNAL we have commented upon the significance of the declining birth rate in France during recent years in French Departments not included in the zone of occupation. An article in *Science* helps to complete the picture by publishing figures relating to the French civil population in occupied territory. During 1915 and 1916, there was in Lille, the largest city in occupied France, a 47 per cent. decrease in births and a 45 per cent. increase in deaths as compared with pre-war ratios. The increased percentage of deaths occurred more particularly between the ages of one and nineteen years, where it was 81 per cent. more in 1915-1916 than in 1913-1914, and among those sixty years and over, it was 85 per cent. It must be taken into consideration that large numbers of men most physically fit between the ages of 20 and 45 had been removed for military duty, and entire families among the more healthy well-to-do emigrated at the time of the invasion.

Tuberculosis, brain hemorrhages, and heart affections were the principal immediate causes of the increased number of deaths; war conditions, especially the insufficient amount and variety of food and the necessary return of aged men and women to hard labor in the

fields were the principal ultimate causes. In Charleville, an agricultural city, the same conditions have been reported, and it is fair to assume that these cities are but two examples of the birth and death rates prevailing throughout the occupied territory of France.

### THIRD SURVEY OF HOSPITALS.

IN the interest of the medical profession and for the sake of the community which seeks the service of the hospital, there is being conducted under the auspices of the American Medical Association a third survey of the hospitals all over the country. Considerable information has already been collected as a result of extensive correspondence, and questionnaires have been tabulated and forwarded to committees representing the state medical associations in each state. In order to check up the information gathered by the Association, the state committees also have in many instances undertaken to investigate the hospitals. The primary purpose of this survey is to provide a reliable list of hospitals which can furnish a satisfactory intern training; but the investigation is not limited to intern hospitals, for all institutions will be included in order to obtain data which may be useful in the future in classifying hospitals. The following state committees are conducting investigations in the New England States:

Massachusetts: Dr. R. L. DeNormandie, chairman; Dr. E. L. Davis, Dr. Homer Gage; New Hampshire: Dr. George C. Wilkins, chairman; Dr. E. B. Eastman, Dr. John C. Hucks; Maine: Dr. D. A. Robinson, chairman; Dr. A. S. Thayer, Dr. J. Sturgis, Dr. O. C. Davies, Dr. P. M. Ward; Vermont: Dr. Clarence H. Beecher, chairman; Dr. W. S. Nay, Dr. H. C. Tinkham; Connecticut: Dr. P. W. Bill, chairman; Dr. C. A. Tuttle, Dr. George Blumer, Dr. W. R. Steiner; Rhode Island: Dr. J. M. Peters, chairman; Dr. F. T. Rogers, Dr. W. F. Flanagan, Dr. A. H. Miller, Dr. A. H. Harrington.

The closer relationship which the hospital now bears to the public in the community which it serves makes it all the more important that the service rendered by it shall be excellent in character.

### MEDICAL NOTES.

**MALNUTRITION AND THE PRICE OF MILK.**—A survey made by the Health Department of New York has revealed the fact that many children are deprived of milk and undernourished because of the high cost of milk. Of 11,007 families visited, 5,775 mothers have informed the health department nurses that this is true. The survey showed that 1294 children were suffering from malnutrition, 993 from anemia, 735 were under weight, 608 were suffering from miscellaneous disorders, and 3,648 were undernourished. The Dairymen's League has issued a statement disclaiming responsibility for a predicted raise of two or three cents a quart in the retail price on October 1.

**DRUG PRICE CHANGES.**—The following quotations have been announced in the price of drugs: Salicylates have advanced five cents a pound, making the new schedule of prices ninety cents for salol, fifty cents for salicylic acid, and fifty-five cents for salicylate of soda; formaldehyde has advanced one and one-half cents a pound; U. S. P. permanganate of potash is now selling for sixty-five and seventy cents a pound, showing an increase of five cents a pound. The leading producers have advanced U. S. P. benzoate of soda five cents a pound, and are now quoting ninety cents and one dollar a pound minimum. Quinine is selling for \$1.35 and \$1.40 an ounce, and orders cannot be filled as there is little being imported from Java or any other foreign source.

**REPORT OF INFLUENZA CASES.**—The report of influenza cases to the Public Health Service for the week ending September 27 includes three hundred cases. Among these are the records of fourteen states. The disease has manifested itself for the most part in a mild form. Surgeon General Blue has issued a warning that this fact should not cause individuals and city and state authorities to neglect every sanitary precaution.

### BOSTON AND MASSACHUSETTS.

**WEEK'S DEATH RATE IN BOSTON.**—During the week ending October 4, 1919, the number of deaths reported was 170 against 1,176 last year, with a rate of 11.13 against 98.13 last

year. There were 33 deaths under one year of age against 92 last year.

The number of cases of principal reportable diseases were: Diphtheria, 78; scarlet fever, 28; measles, 19; whooping cough, 9; typhoid fever, 6; tuberculosis, 46.

Included in the above were the following cases of non-residents: Diphtheria, 9; scarlet fever, 6; tuberculosis, 2.

Total deaths from these diseases were: Diphtheria 4; whooping cough, 1; typhoid fever, 1; tuberculosis, 12.

Included in the above were the following non-residents: Diphtheria, 1.

Influenza cases, 22; influenza deaths, 2. Last year, influenza deaths, 989.

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**THE NORFOLK DISTRICT MEDICAL SOCIETY.**—A stated meeting of the Society will be held at the Massachusetts School for the Feeble-Minded, Waverley, October 28, 1919, at 12.30 P.M. Business meeting at 12.30 P.M. Luncheon, 1 P.M. Clinical talk and demonstration of cases, and Methods of training children.

WALTER E. FERNALD, M.D., Supt.  
Inspection of the Institution.

The Censors meet Thursday, November 6, 4 P.M., for the examination of candidates.

BRADFORD KENT, M.D., Sec.

**NEW ENGLAND SURGICAL SOCIETY.** Clinical Meeting in Boston, Mass., Tuesday, October 28, and Wednesday, October 29, 1919.

Tuesday, October 28.

A.M.	
10—12.30	Operations and Demonstrations, Massachusetts General Hospital.
P.M.	
1	Luncheon, Massachusetts General Hospital.
2.30—4.30	Operations and Demonstrations, Boston City Hospital.
7.30	Dinner, Aesculapian Room, Harvard Club.

Wednesday, October 29.

A.M.	
9 10.20	Operative Clinic, Dr. W. P. Graves, Free Hospital for Women, Brookline.
9—10.20	Operative Clinic, Dr. J. T. Bottomley, Carney Hospital, Boston.
11 12.30	Operations and Demonstrations, Peter Bent Brigham Hospital.
P.M.	
12.30—1.30	Clinic, Harvard Medical School, Prof. Harvey Cushing.
1.30	Luncheon, Faculty Room, Harvard Medical School.
2.30 3.30	Reconstruction Work, Robert B. Brigham Hospital, Parker Hill.

3.45—5	Collis P. Huntington Hospital, Harvard Medical School. (Harvard Cancer Commission.)
3.45—5	Inspection of Harvard Medical School.
3.45—5	Clinic, Children's Hospital, Longwood Avenue.

#### NEW ENGLAND NOTES.

**WAR RELIEF FUNDS.**—The principal New England War Relief funds have reached the following amounts:

French Orphanage Fund	\$517,846.36
Italian War Relief Fund	306,859.47
French Wounded Fund	
(for the American Memorial Hospital at Rheims)	199,368.00

The Italian War Relief Fund has issued the following appeal for help for the suffering children of Italy:

"The children of Italy are calling for your help. Hundreds are stricken with tuberculosis, being entirely underfed to withstand the hardships of life. They need food and clothing at once."

**ORGANIZATION OF VERMONT PHYSICIANS AGAINST INFLUENZA.**—A group of one hundred physicians is to be organized by the State Board of Health of Vermont to combat influenza if the disease appears in epidemic form this year. These physicians will volunteer their services for this work and will be paid by the United States Public Health Service.

#### The Massachusetts Medical Society.

##### STATED MEETING OF THE COUNCIL, OCTOBER 1, 1919.

A STATED meeting of the Council was held at the Boston Medical Library, Wednesday, October 1, 1919, at twelve o'clock, noon, the President, Dr. Alfred Worcester, of Waltham, in the chair, and the Vice-President, Dr. A. R. Crandell, of Taunton, in attendance. The following 86 councilors were present:

BARNSTABLE.	ESSEX NORTH (continued).
W. D. Kinney.	R. V. Baketel, M.N.O.
BRISTOL NORTH.	G. E. Kurth.
A. R. Crandell, Vice-Pres.	ESSEX SOUTH.
F. A. Hubbard, M.N.C.	W. T. Hopkins, V.P.
BRISTOL SOUTH.	R. E. Bicknell.
J. A. Barré, V.P.	H. K. Foster.
W. A. Dolan.	J. F. Jordan.
ESSEX NORTH.	G. M. Kline.
J. J. O'Sullivan.	W. G. Phippen.
	Emile Poirier.



## HAMPDEN,

T. S. Bacon.  
A. C. Eastman.  
J. P. Schneider.

## MIDDLESEX EAST,

G. N. P. Mead.

## MIDDLESEX NORTH,

W. B. Jackson.  
J. H. Lambert.  
E. G. Livingston.  
J. A. Mehan.

## MIDDLESEX SOUTH,

H. T. Baldwin, V.P.

Richard Collins.

C. H. Cook.

John Duff.

W. E. Fernald.

C. E. Hills.

C. E. Mongan.

F. W. Itice.

W. D. Rnston.

C. H. Staples.

E. H. Stevens.

A. K. Stone, Treas.

F. R. Stubbs.

Fresenius Van Nijls.

G. L. West.

G. W. W. Whiting.

Alfred Worcester, Pres.

## NORFOLK,

F. P. Denny, V.P.

E. E. Bancroft.

D. N. Blakely.

W. L. Burrage, Sec.

H. W. Dana.

C. S. Francis.

G. W. Kaan.

Bradford Kent.

M. V. Pierce.

S. H. Rubin.

L. F. Vickery.

## NORFOLK SOUTH,

E. H. Bushnell, V.P.

G. H. Ryder, M.N.C.

## PLYMOUTH,

W. C. Keith.

F. G. Wheatley.

## SUFFOLK,

J. L. Ames.

E. W. Bartol, C.

E. S. Boland.

F. J. Cotton.

J. W. Cummin.

L. J. Cummins.

Lincoln Davis.

C. M. Green, C.

J. C. Hubbard.

D. F. Jones.

H. B. Loder.

W. A. Morrison.

F. S. Newell.

Abner Post.

Stephen Rushmore.

E. W. Taylor, C.

D. H. Walker.

## WORCESTER,

W. J. Delahanty, V.P.

F. H. Baker.

W. P. Bowers.

M. F. Fallon.

Homer Gage.

E. L. Hunt.

W. L. Johnson.

G. O. Ward.

F. H. Washburn.

S. R. Woodward, Ex-P.

## WORCESTER NORTH,

E. L. Fiske, M.N.C.

J. G. Henry.

A. P. Mason.

W. F. Sawyer.

Carl Ten Broeck, Rockefeller Institute, Princeton, New Jersey.

3. That the following named Fellows be deprived of the privileges of fellowship, under the provisions of Chapter I, Section 8, of the by-laws:

Frank Sumner Atwood, of Salem.  
Harry Clinton Cady, of New Orleans, Louisiana.  
Wadie Fadoul Corrie, of Detroit, Michigan.  
William Horace Davis, of Dorchester.  
Thomas Brinsley Foley, of Boston.  
Frank Mackie Johnson, of Los Angeles, California.  
Charles Dixon Smith Lovell, of Lynn.  
Patrick Joseph Maroney, of Westfield.  
Theodore Edward Alexis McCurdy, of Roxbury.  
John William McKeon, of Worcester.  
Adelbert Howard Monty, of Holyoke.  
Wilson George Snaillie, of Brazil.  
Henry Randolph Storrs, of Vancouver, British Columbia.

4. That the following named Fellows be permitted to change their district membership without a change of legal residence, under Chapter III, Section 3, of the by-laws:

Delos Judson Bristol, Jr., from Norfolk to Suffolk.  
William Immac Reid, from Middlesex South to Suffolk.

Harry Fairbanks Hartwell, from Middlesex South to Suffolk.

John Léroy Longue, from Norfolk to Suffolk.

Irving Sobetky, from Norfolk to Suffolk.

CHARLES M. GREEN, Chairman.

The same conciliar read the report of the Committee on Membership and Finance as to Finance, and it was accepted.

## REPORT OF COMMITTEE ON MEMBERSHIP AND FINANCE, AS TO FINANCE.

The Committee on Membership and Finance makes the following recommendation as to finance:

That the affiliation with the BOSTON MEDICAL AND SURGICAL JOURNAL be continued during the year 1920, at an expense to the Society of \$3.00 for each member in good standing.

For the Committee on Membership and Finance.  
CHARLES M. GREEN, Chairman.

Dr. H. G. Stetson presented the report of the delegation of the Massachusetts Medical Society to the House of Delegates of the American Medical Association in June, 1919, and the report was accepted with applause. (See appendix.)

The Secretary read the report of the Committee on State and National Legislation, and it was accepted.

## REPORT OF COMMITTEE ON STATE AND NATIONAL LEGISLATION.

Since the Annual Meeting of the Society, the Committee on State and National Legislation has held two meetings.

At the first it was voted to oppose the plan of placing the Board of Registration in Medicine under a director, and also to favor Senate Bill No. 574, which dealt with school physicians and the appointment of directors of physical education, with the aim of improving the physical condition of the school children.

In each instance the efforts of the Committee failed. The second meeting was held jointly with the Committee on Legislation of the Homeopathic Medical

The record of the last meeting was accepted by vote, as printed.

Dr. C. M. Green presented the following report of the Committee on Membership and Finance as to Membership, and it was accepted and its recommendations adopted by vote.

## REPORT OF COMMITTEE ON MEMBERSHIP AND FINANCE, AS TO MEMBERSHIP.

The Committee on Membership and Finance makes the following recommendations as to membership:

1. That the following named Fellows be allowed to retire, under the provisions of Chapter I, Section 5, of the by-laws:

Harriet Louise Harrington, 20 Monadnock St., Dorchester, with remission of dues for 1919.

Daniel Edward Keefe, of Springfield.

John Henry Kennealy of 117 Harvard St., Brookline, with remission of dues for 1917, 1918, and 1919.

Clement Willis Sparhawk, of Liberty St., Middleton.

2. That the following named Fellows be allowed to resign under the provisions of Chapter I, Section 7, of the by-laws:

George Peavey Laton, 520 West Seventh St., Los Angeles, California, with remission of dues for 1917, 1918, and 1919.

Anna Peabody Marsh, of Danvers.

Allan Joseph McLaughlin, of Washington, District of Columbia, as of December 31, 1919.

Harrington Bennett Munroe, 6372 Hollywood Boulevard, Los Angeles, California, with remission of dues for 1917, 1918, and 1919.

Joseph Shoham, of Jerusalem, Palestine (wife's address, 123 Charlotte St., Asheville, North Carolina), with remission of dues for 1919.

Society. Work for the coming winter was outlined and the possible employment by the Society of a paid publicity agent was discussed.

JAMES S. STONE, *Secretary*.

Dr. E. W. Taylor reported for the Committee on Publications and Scientific Papers. He announced that the Shattuck lecturer in 1920 would be Dr. Allan J. McLaughlin of the Public Health Service in Washington, formerly Massachusetts State Commissioner of Health. He read the following notice from the Secretary as regards medical news for the BOSTON MEDICAL AND SURGICAL JOURNAL.

*Dear Doctor:—*

For the purpose of procuring more medical news from the eighteen District Medical Societies for the official organ of the Society, the BOSTON MEDICAL AND SURGICAL JOURNAL, will you be good enough to send me any items of news from your district, of which you have knowledge. I now live near at hand to the printing office where the JOURNAL is published weekly, and am in constant touch in the editing of the publications of the Society, so that matter sent me can be given to the printer promptly, and I am assured that it will be published as soon as space and make-up permit.

We want announcements that Fellows have returned from military or naval service and where they are to be found; notices of appointments to office, to hospital staffs, to medical examinations or to military or civil positions; as to the hospital or nursing situation in your community; also marriages and deaths. It has been the aim of the editor to publish in the JOURNAL a suitable notice of the death of every Fellow who passes on. Data from the friends of those who knew the departed will help to make the notices fuller and better. Announcements of the coming meetings of the District Societies should be sent in early, at least two weeks before a given meeting. Abstracts of the proceedings will be welcome.

Faithfully yours,

WALTER L. BURRAGE,  
*Editor for the Society.*

42 Eliot Street, Jamaica Plain,  
Telephone 24, 1919.  
Telephone, Jamaica 469.

He emphasized the purport of this notice and said that, as a former editor of the JOURNAL, he realized how lax doctors are in sending in news items for publication. It is essential for every member of the Society to make it a personal responsibility to send in the facts as requested. He read the following vote of the Committee on Publications and Scientific Papers that had been passed at the meeting of the Committee in June:

*Voted*.—That the annual directory of January 1, 1920, shall consist only of the alphabetical directory, the recapitulation printed in the directory of 1918 on page 63, the notice to Fellows, and the officers and standing committees of the Massachusetts Medical Society and officers of the District Medical Societies, all the rest of the matter in previous directories being omitted for a period of three years. Also

*Voted*.—That the secretary's revised alphabetical list of Fellows be tried up as regards the addresses, during the months of November

and December, 1919, by means of the directories and telephone books of the cities of the Commonwealth; that the copy thus prepared be put in the hands of the printer before January 1, 1920, and the directory be published as soon after that date as possible.

He said the action was taken for reasons of economy and in order that the directory might be published more promptly. This year it appeared as a supplement to the issue of the JOURNAL of April 24, when nearly a third of the year had gone. He spoke of the frequent use that he made of the directory and asked for the opinion of the Council.

Dr. S. B. Woodward, as past president of the Society, said that he had made frequent use of the Local List. Dr. G. W. Kaan had also found it useful. He moved that the directory be published in 1920 with both alphabetical and local lists, as heretofore, and it was so voted.

Reports of committees to consider the petitions for reinstatement of G. D. McGauran, J. J. Hoban, H. P. Blodgett, R. C. Fish, G. J. Connor, J. J. Maney, and J. A. Carroll were read severally by the Secretary, and each report was accepted and its recommendations adopted by vote.

The report of the Committee on N. M. Crofts, recommending that he be not reinstated, was accepted by vote.

The Secretary read a petition of Alva H. Warren of Everett for reinstatement and the following committee was appointed to consider it: A. A. Jackson, R. W. McAllester, G. E. Whitehill.

The President nominated and the Council appointed the following committee to audit the Treasurer's accounts: C. H. Hare, Boston; C. J. McCormick, Waltham.

In the same way were appointed: Channing Frothingham as a delegate to the conference at the American Medical Association on Medical Education at Chicago, in February, 1920; and W. P. Bowers to the Conference on Medical Legislation at the same time and place.

The President nominated and the Council appointed the following as delegates to the annual meeting of the Vermont State Medical Society, October 9 and 10, 1919: H. G. Rockwell of Amherst, and G. D. Weston of Springfield.

Dr. J. W. Bartol moved and it was seconded and voted that the Committee on Medical Education and Medical Diplomas be instructed to revise the list of medical colleges, diplomas from which are accepted by the Council from candidates for fellowship.

Dr. A. K. Stone called attention to a suggestion which had been made that a legislative agent for the Society be obtained and he moved that the privileges of the floor be accorded to Dr. J. B. Hawes, 2d. The motion being put was carried unanimously and Dr. Hawes addressed the Council. He said that since 1907

he had been in close touch with legislative affairs at the State House, especially in the matter of tuberculosis. He had attended many hearings in regard to health matters, and after a great deal of thought he had come to the conclusion that the Massachusetts Medical Society is not the force which it should be at the State House and that the methods now employed are not the best ones. He had seen the highest type of medical man insulted by members of the legislature. He believed in publicity and thought that ignorance of our medical needs is really the cause of the action of the legislators toward physicians, who, he thought, are ignored. He mentioned a specific instance and suggested that the Legislative Committee be empowered to obtain the services of a man for part time who knows journalism and who is able to educate the representatives and the public as to the needs of the medical profession.

Dr. E. H. Stevens thought that this matter ought to be endorsed and he moved that such a legislative agent be employed by the Committee on State and National Legislation. The motion being put was seconded and carried unanimously, after the President had stated that the proposition had been submitted to a joint meeting of the Committee on State and National Legislation with a similar committee of the Massachusetts Homeopathic Medical Society, and had been improved.

Dr. Samuel B. Woodward made the following remarks: "Before this matter is over, as I have been interested in legislative matters for a long time, I should like to defend the members of the legislature in general from the statement that as a rule they have been insulting to the medical profession. Now, I have been to the State House continuously for three years and have been in touch with legislation and have got a good deal of help from legislators. I know that insulting remarks have been reported to have been made to physicians by legislators, but as for me, I have been helped by members of the legislature, and members of the legislature have helped me, not from any personal reasons, but I am fully convinced they did it because I was president of the Massachusetts Medical Society. I think the Massachusetts Medical Society has a good deal of influence before the Legislature, and I would like to say that we are not ignored. I will say that requests have come to me from the executive office for opinions on many matters, and I think the Massachusetts Medical Society has a pretty good standing."

Dr. F. J. Cotton said he had been asked to bring up a matter that seemed to be of importance, namely: that the Board of Registration in Medicine, acting under the Act of the Legislature of May 2, 1917, have summoned several of the fellows of the Society before the Board and have penalized them. He said that there was a wide feeling of unrest in the community and a feeling that the members of the profes-

sion are in danger of being brought before the said Board of Registration in Medicine on trumped-up charges by people who will not pay their bills, and that just at present there was a tendency on the part of lawyers to victimize the doctor, that we were going through a stream of malpractice suits in this State and the feeling was that there is a campaign being waged, that if a man has been brought up for acts for which he is blameless, it would render his defense in civil suits more difficult. He moved that the privileges of the floor be extended to Dr. W. H. Robey, Jr. The motion was seconded by Dr. W. P. Bowers, who acknowledged that there had been a good deal of criticism relating to Chapter 218 of the Acts of 1917 and thought it was the time and place for any criticism to be presented. The motion being put was carried unanimously. Dr. Robey described the facts as he knew them of a young man who was a graduate of the Boston City Hospital, a satisfactory house-officer and a recent member of the Massachusetts Medical Society. His character and record were without blemish, so far as he knew. He had been called to attend an old lady suffering with influenza during the recent epidemic, and while attending the wife had been asked to see her husband. He took the man's temperature and prescribed a course of treatment. His bill was disputed on the ground that he had not given the man proper examination, although the wife's treatment was satisfactory. The bill was reduced in amount by agreement, and finally paid. Then the physician was summoned before the Board of Registration in Medicine and, after a hearing, his license was taken away for a period of two months on the ground of extortion. Dr. Robey was of the opinion that the penalty was excessive and that the law might act as an injustice to members of the profession, in that they would be called upon to appear before the Board of Registration and defend themselves of charges which had an insufficient basis. Dr. Bowers took the floor and defended the Act as vital to the safety of the public and to the interests of the medical profession. He recited the full facts in the case referred to and said that the Board had held four hearings in the matter, that the physician in question had not made a proper examination, simply placing a thermometer in the patient's mouth and making no physical examination, prescribing the same treatment that the wife received. The physician had not told the truth in several specified instances and the Board had been unanimous in its finding. He read provisions of Chapter 218 of the Acts of 1917 and defined the word *extortion*. The Board felt that the evidence showed that, under the circumstances, the physician had "made an undue exaction," one of the dictionary definitions of "extortion."

The action of the Board was supported by Dr. M. F. Fallon and Dr. C. H. Cook, two other

members of the Board of Registration in Medicine, and by Dr. J. L. Ames. A vote of confidence in the Board of Registration in Medicine was suggested, and finally seconded and carried unanimously.

Dr. H. W. Dana said that when the Harrison Narcotic Act was first put into effect for the purpose of preventing the illicit use of drugs, the fee was one dollar, that under the amendment to the Act passed in 1919 the fee had been increased to three dollars a year. He thought that the amount was too much and introduced the following resolution:

*Resolved:* "That taxation for the purpose of obtaining revenue, of the medical profession as a class, provided for by the Harrison Narcotic Act as amended in 1919 by Congress to provide additional revenue, is illogical, inequitable and undesirable.

That for the purposes of the Harrison Narcotic Act, the payment by each doctor of a yearly registration fee of twenty-five cents would suffice.

That this Society deprecates the taxation for revenue of physicians as such, and urges upon its representatives in Congress, the reduction of the amount of the Narcotic Registration Tax from the present sum of three dollars, to the sum of twenty-five cents a year."

The resolution was seconded by Dr. Kaan and on motion by Dr. A. K. Stone it was referred by vote to the Committee on State and National Legislation for a future report to the Council.

Dr. W. A. Dolan of Fall River said that at a meeting of physicians in Fall River, called for the purpose, the question was brought up of specialists coming from out of town to examine, pass upon, and criticize the findings in cases which were being treated by the physicians of Fall River, at the instance of insurance companies and without notifying the men in charge of the cases. He called attention to Article IV of the Code of Ethics of the Massachusetts Medical Society, namely:

"Physicians in their professional relations should be governed by strict rules of honor and courtesy. Their conduct toward each other should be such as to secure mutual confidence and good will.

"They should not consent, except in cases of pressing emergency, to take charge of a patient when another is in attendance, until such attendant has been notified."

He moved that, in the opinion of the Council of the Massachusetts Medical Society, the provisions of said article appertain to the examination of cases for the Industrial Accident Board as well as to private cases, and that no examination should be made by a physician for such Board without notifying the attending physician.

Dr. C. H. Cook said that he had had an opposite experience, that the physicians who came

to see cases under his care invariably asked him to accompany them in the examination of the patient.

Having been duly seconded, Dr. Dolan's motion was passed.

The Treasurer asked for a vote on the amount of the annual dues of the Society for the year 1920, and on his motion it was voted that the dues for the ensuing year remain at six dollars.

Adjourned at 1.50 P.M.

WALTER L. BURRAGE, *Secretary*.

#### APPENDIX TO PROCEEDINGS OF THE COUNCIL, OCTOBER 1, 1919.

#### REPORT OF DELEGATION FROM THE MASSACHUSETTS MEDICAL SOCIETY TO THE MEETING OF THE HOUSE OF DELEGATES, AMERICAN MEDICAL ASSOCIATION, JUNE 9-13, 1919.

Your delegates to the recent meeting of the American Medical Association, held at Atlantic City in June last, beg leave to submit to the Council the following report of the meeting:

The Massachusetts Medical Society is entitled to five members in the House of Delegates of the American Medical Association. The regularly appointed delegates to the Atlantic City session were: Dr. S. J. B. Blake, of Boston; E. F. Cody, of New Bedford; F. B. Lund, of Boston; H. G. Stetson, of Greenfield; and L. E. Woodward, of Worcester. Of these, Drs. Blake and Stetson were present. Dr. Woodward was not present, his seat being occupied by his alternate, Dr. J. F. Burnham, of Lawrence; Dr. Lund was unable to be present and his seat was occupied by his alternate, Dr. W. H. Robey, of Boston; Dr. Cody was not present nor did his alternate appear at any of the meetings of the House of Delegates.

The custom inaugurated last year was again followed this year, most of the work of the House of Delegates being done during the first two days of the week and preceding the regular scientific meetings of the Association, the opening general meeting coming on Tuesday evening instead of on Tuesday morning, as was formerly the custom. Following this were three days of scientific section meetings, the final meeting of the House of Delegates for the election of officers and the closing business coming on Thursday afternoon.

From the report of the Secretary, it was learned that the membership of the Association on May 1st last was \$2,288, this being the membership of the various state associations which compose the American Medical Association. The Fellowship of the Association on May 1st last was 45,412, a net increase during the year of 697.

The Trustees report that the circulation of the *Journal* at the end of the calendar year was about 70,000. Of the special journals published by the Association, the *Archives of Internal Medicine* has a circulation of 2600 and the *American Journal of Diseases of Children* a circulation of about 2100. They also report that during the year the Association has begun the bi-monthly publication of a Spanish edition of the *Journal* for circulation in Central and South America and this promises to be successful. Recently also the Association has begun the publication of the *Archives of Neurology and Psychiatry*, and on May 1st last this journal had a subscription list of nearly 900. The Association also publishes the American Medical Directory and the

quarterly Cumulative Medical Index, both of which have been carried on at a loss during the past year.

The Treasurer's report shows the Association to be in a sound financial condition, having a plant and equipment account of about \$300,000, materials, accounts receivable, miscellaneous and cash on hand of about \$175,000, and reserve fund account of over \$200,000.

Dr. Alexander Lambert, the President elect, in his address before the House of Delegates, pointed out very forcibly the unsuccessful manner in which the United States is endeavoring to control the use of opium and the hardship and annoyance it is imposing upon physicians as a whole because of the actions of "a few renegade and depraved members of the profession who, joining twith the commercial class, make it possible to continue the evil and illicit drug trade." In order that the purpose of the law might be carried out, it was his suggestion that the American Medical Association request the Internal Revenue Department to call together a conference composed of representatives of the medical profession, the wholesale and retail drug interests and representatives from each state, with the belief that such a conference, through the co-operation and concerted action of all interested parties, might be of great value in establishing more complete and just control of the sale of opium and its alkaloids. This suggestion of Dr. Lambert's was carried out by vote of the House of Delegates, the vote further authorizing the speaker of the House of Delegates to appoint a committee of three to represent the American Medical Association, if such a conference were called.

The Judicial Council, acting under its authority to investigate general professional conditions and all matters relating to the relations of physicians to one another and to the public, makes a report of its investigations relating to Age and Disability Insurance for physicians. The Council has been informed that actuarial statistics bear out the following statement, namely: That on the average of 100 individuals entering on a business career at the age of 25, when these have reached the age of 65 years, five of the 100 will be in comfortable circumstances, financially; six will be self-supporting; fifty-three will be receiving financial assistance of some form; the balance will be dead. It should be recognized that these figures are not limited to professional men, but include those from all walks of life. Nevertheless, in the opinion of the Council, they warrant a further investigation and study of the advisability of undertaking some organized effort for the relief of members of the medical profession who are in financial distress because of age or other physical disability. Should the investigations of the Council warrant it in doing so, a further report will be submitted to the House on this subject at a future annual session.

A most excellent report was that of the Council on Health and Public Instruction made by its Chairman, Dr. Victor C. Vaughn, of Michigan, who needs no introduction. This report was a résumé of the work of the Council since its beginning in 1910, followed by a discussion of the future work of the Council. Very little has been done by this Council in the line of new and original work during the past two years owing to war conditions and the fact that its entire personnel was in the service. With the return to civil life of its members, it is now planning to take up work on national lines that should lead to improvements in many matters pertaining to general health. The report merits careful reading and thought.

For many years the report of the Council on Medical Education to the House of Delegates has been a most complete study of the present day problems of medical education. The report of the Council this year made by Dr. John M. Dodson, the Chairman, measured up to the high standard of previous

years in every way. To any one interested in medical education, as all physicians should be, it is valuable and interesting reading. It should be more generally and carefully read than it is likely to be. In no other way is it possible to know the enormous amount of work which has been carried on throughout the country concerning the details of medical education, or to understand the very great advances in medical standards which have resulted in consequence of the work of this Council. In this year's report much more attention has been given to the study of hospital standardization than has been included in some previous reports. The Council is taking up this matter with reference to the relationship of hospitals to interne service, endeavoring to raise the standard of teaching of internes. The Council recognizes the complaint which comes from rural committees, that physicians as trained at the present day are finding that they cannot afford to settle in country districts, that the income is not sufficient to give even a reasonable return on the cost entailed in obtaining this education. The Council does not, however, believe that the rural communities are going to suffer; it believes that these communities will not only have sufficient physicians for their needs but better trained physicians. In this connection, it may be well to quote from the opening address of the speaker of the House of Delegates, Dr. Hubert Work, of Colorado, a very keen, broad-viewed man, in which he says: "It is evident that the relentless pressure of this Association for higher college and professional standards, with their time and financial exactions on the one side and the decrease in disease through preventive medicine on the other, are grinding between them students and physicians of average opportunities. Medical requirements for practice demand at least seven years of schooling beyond the high school. In some universities, two degrees and nine years' time are demanded for graduation. That included in the average medical college curriculum costs so much time and money that only the rich can attain it. The crossroads communities will soon have no qualified physician, and from necessity will revert to the opportunist and midwife. Should undergraduate schools undertake to finish specialists in medicine, presumably the function of postgraduate schools? The primary function of a physician, to cure the sick, is submerged by the scientific ambition to diagnose rare diseases or a few ailments, with an inevitable loss of perspective necessary to the accomplished diagnostician. Failure to gain practical knowledge of the simple things in medicine tremendously depreciates recent graduates. American medical colleges are graduating medical scientists, and our hospitals, nursing specialists, both technicians and both out of reach of the family of average means."

Another chapter was added to the subject of Social Insurance by the report of the subcommittee of the Council on Health and Public Instruction, made by its Chairman, Dr. Alexander Lambert, of New York. This committee is composed of Dr. Lambert, Chairman; Dr. M. L. Harris, of Chicago; Dr. F. L. Van Sickle, of Pennsylvania; and Dr. S. S. Goldwater, of New York; and practically carries on the investigation of this subject previously conducted by the Council itself.

Dr. Vaughn, the Chairman of the Council on Health and Public Instruction, in referring to the subject of Social Insurance, makes the following remarks: "The introduction during the last two sessions of our legislature of bills providing for health insurance and the appointment of commissions to study this subject in a number of states, notably California, Illinois, New Jersey, New York, Ohio, Pennsylvania, and Wisconsin, and the introduction of a bill in the New York legislature, all combine to make this question one of the vital issues now before the medical profession. No state has as yet

adopted social insurance. In New York the bill endorsed by Governor Smith passed the Senate but failed to pass the house. In California, the bill recommended by the state commission was on referendum defeated by a large popular vote. In Wisconsin, the commission reported against the proposition. In Ohio, the commission was in favor of limited social insurance. In Pennsylvania and Illinois, the commission recommended a continuation of its activities and further study of the question. The growing interest shown in this subject during the last two years, however, makes it all the more important that careful attention should be given to it by physicians, both as individuals and as a profession. The attitude of the majority of physicians up to date has been one of unopinioned and often unreasoning opposition, without any effort to study the question or to consider the arguments put forward in favor of the proposed plan. Unreasoning opposition or sweeping and often erroneous general arguments against the measure will not prevent its adoption nor will it enhance the influence of physicians. It is of the utmost importance to the medical profession at present that we give this question the most careful, painstaking, patient, and disinterested study; that we qualify ourselves as authorities instead of allowing this function to be exercised by the active proponents of social insurance. To this end it is particularly necessary that we study this question dispassionately and critically, discriminating between fundamental principles and nonessential details.

"The report of the subcommittee deals largely with further information upon the subject, adding to that previously given to the House of Delegates in each of the past four years. It is a very exhaustive and complete report and is one that should be studied very carefully by physicians in general, whatever views they may hold upon the subject. The conclusions of the report are pointed and forceful and should be brought to the attention of this audience for your serious thought. 'The economic problems of the profession are greater and more than can be solved by the individual physician today. It, therefore, becomes the duty of organized medicine to take this burden and aid in its solution for the best interests of all and to bear the burden of solution if the individual cannot bear it. This must be done through the organization of the American Medical Association, of the state association and of the county societies, all working in harmony for a common purpose. The actual every day work of the solution must be taken in hand and borne by the county societies and the state associations and they must wake up to their duties vastly more than they ever have before for the sake of their own profession. This will require an intelligent reading of at least the reports published by the American Medical Association on the various forms of health insurance and other economic questions. Intelligent action can be based only on intelligent knowledge and until individual physicians will take the trouble to read and inform themselves on this subject, they are bound to act through ignorance and prejudice to their own injury.' This committee recommends that the Judicial Council and the Council on Health and Public Instruction continue their joint action in studying these economic questions. The committee further recommends that the House of Delegates request each constituent association to appoint committees to study the subject and to keep their component societies informed on these questions, that the medical profession be not caught unawares as it was when the Workmen's Compensation Laws were passed, and that these committees investigate local economic conditions and report the results of their studies to the special committee of the American Medical Association. The committee further recommends that before all legislatures, in which laws on social insurance are being considered, representatives

from the profession shall demand the opportunity to help mold these laws so that the public shall not be deprived of the best medical care and so that full justice shall be given to both the public and the profession."

Your delegates are pleased to report to you that through their efforts a member of this Society, Dr. David L. Edsall, of Boston, was elected as first Vice-President of the American Medical Association. It also takes this occasion to record its pleasure in aiding in the reflection of Dr. D. Chester Brown, of Danbury, Conn., to the Board of Trustees of the Association, Dr. Brown practically representing New England on the Board.

The House of Delegates of the American Medical Association is composed of about 150 members, representing not only parts of the country but all the different lines of medicine that one can possibly imagine. After a continuous service of seven years in the House, I am more and more impressed with the amount and character of work accomplished by the Association; that its ideals are constantly growing better and that it is trying to live up to its ideals, there is no question. There are many men active in the Association who realize that the Association should stand for more than the reading of scientific papers, men who realize very clearly not only the very great work which the Association has accomplished for medicine in the past but also recognize with an equally clear vision points where the Association has not accomplished all that it should, or perhaps not accomplished anything at all, and they do not hesitate to call attention to these errors of deficiency occasionally and in no uncertain way. New ideas and thoughts are constantly being brought forward and considered carefully, and constant work of a high order is constantly being carried on by the Association through its Councils and committees, encouraged and sponsored by its officers and the House of Delegates. To such men as Bevan, Dodson, Dyer, James Moore, Vaughn, Councilman, and a host of others, the Association owes much. The annual reports of the Council on Medical Education, on Health and Public Instruction, together with a study of the work carried on by the Council on Pharmacy and Chemistry from year to year, illustrate very forcibly the amount and the character of work that is constantly being undertaken and carried on by this great national Medical Association. Every effort should be made to bring about a closer relationship between the national Association and the various state societies; there should be a more intimate knowledge of what the national Association is trying to do, and state associations should be ready and eager to offer support and encouragement to the work, or what perhaps is of equal value, be ready to offer just and fair criticism of work or methods in the broadest spirit through proper channels. The opposite is equally true, that work of the various state societies having a national interest should, without hesitation, be brought to the attention of this national organization. In other words, there should be complete cooperation between the state and national organizations in the broadest kind of way. In no other way can medicine or any other object attain its highest perfection.

Respectfully submitted,

HALBERT G. STETSON.

*For the Delegates of the Massachusetts Medical Society to the American Medical Association.*

DR. GEORGE L. WAKEFIELD, who had been practicing in Manchester, N. H., for the past 25 years, died on October 3, at the Eliot Hospital, at the age of 72 years. Dr. Wakefield was born in Plymouth, Vt., and served with a New Hampshire regiment in the Civil War. In 1870 he was graduated from Hahnemann Medical College at Chicago, and began practicing in Manchester in 1888.

# The Boston Medical and Surgical Journal

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## Address.

### THE NEW CENTURY AND THE NEW BUILDING OF THE MEDICAL SCHOOL OF HARVARD UNIVERSITY.\*

BY OLIVER WENDELL HOLMES, M.D., LL.D.

THE Medical School of Harvard University enters, with the commencement of the present season, upon the second century of its existence. By a fortunate coincidence it takes possession at this same time of the noble edifice which a generous public has raised for the use of the teachers and students of this institution.

Yesterday; today; tomorrow. Let us look backward at the period when this school began its teachings, and mark some of the longer strides which bring the professional condition of the earlier epoch to that of our own. Let us see where we stand today, and we shall know better what to hope for the future of the teaching, the science, and the art of healing.

We are in the habit of counting a generation as completed in thirty years, but two lives cover a whole century by an easy act of memory. I, who am now addressing you, distinctly remember the Boston practitioner who walked among the dead after the battle of Bunker's

Hill, and pointed out the body of Joseph Warren among the heaps of slain. Look forward a little while from that time to the period at which this Medical School was founded. Eight years had passed since John Jeffries was treading the bloody turf on yonder hillside. The independence of the United States had just been recognized by Great Britain. The lessons of the war were fresh in the minds of those who had served as military surgeons. They knew what anatomical knowledge means to the man called upon to deal with every form of injury to every organ of the body. They knew what fever and dysentery are in the camp, and what skill is needed by those who have to treat diseases often more fatal than the conflicts of the battle-field. They knew also, and too well, how imperfectly taught were most of those to whom the health of the whole community was intrusted.

Dr. John Warren, the younger brother of Dr. Joseph Warren, who fell at Bunker's Hill, was the first mover in the project of founding a medical school in connection with Harvard College, and was the first professor of anatomy and surgery. Those who remembered his teaching have spoken to me with admiration of the eloquence and enthusiasm with which he lectured. Dr. John Warren was a man of great

\* Reprinted from the issue of the JOURNAL for Oct. 18, 1893.

energy, spirit, and ability. The lectures of the newly founded school were delivered in Cambridge until the erection of the building known as the Massachusetts Medical College, in Mason street, in the year 1815. It was no easy matter for a busy Boston practitioner to deliver a course of lectures in the University town. But Dr. Warren did not ask whether it was easy or not. "In the fulness of professional business he daily passed over the Charlestown ferry to Cambridge, there not being a bridge at that time; and sometimes, when impeded by ice, was compelled to take the route through Roxbury and Brookline to Cambridge, and to return on the same morning, after himself performing the dissections and giving a lecture, sometimes three hours long." So tells us worthy Dr. Thacher, in the Appendix to his American Medical Biography.

Benjamin Waterhouse, honorably known for having been the introducer of vaccination into America, was the first professor of the theory and practice of medicine. I remember him well, and carry the scar of the vaccination he performed on me. His powdered hair and quene, his gold-headed cane, his magisterial air and diction, were familiar to me from my boyhood. Dr. Waterhouse had his degree from Leyden, where he wrote and defended a thesis, *Dr Sympathia Partium Corporis Humani, eiusque in explicandis et curandis morbis necessaria consideratione*. He had some learning, which he was disposed to make the most of, or perhaps we all are if we have it, and laid himself open to the playful sallies of the students of his time, one of whom announced a course of lectures on oudenology, which was supposed to be a travesty of some of his prelections.

The first professor of chemistry was Aaron Dexter. It was the forming period of that science. Black, Cavendish, Priestley, Lavoisier, were building it up with their discoveries. A course of chemical lectures delivered in Boston or Cambridge at that day was probably, as it certainly was at a later day, very entertaining and not wholly uninteresting. Phlogiston had not definitively taken itself to the limbo of negative entities. But however erude the theories, we may be pretty sure that there was left in the student's mind a memory of startling precipitations, of pleasing changes of color, of brilliant effluviations, of alarming explosions, and, above all, of odors innumerable and indescribable.

It is sad to think that professors honored in their day and generation should often be preserved only by such poor accidents as a Sophomore's jest or a graduate's anecdote. The apparatus of illustration was doubtless very imperfect in Dr. Dexter's time, compared to what is seen in all the laboratories of today. We may admire his philosophy and equanimity, therefore, in recalling the story I used to hear about him.

"This experiment, gentlemen," he is represented as saying, "is one of remarkable brilliancy. As I touch the powder you see before me with a drop of this fluid, it bursts into a sudden and brilliant flame," which 'it most emphatically does not do as he makes the contact. "Gentlemen," he says with a serene smile, "the experiment has failed,—but the principle, gentlemen, the principle remains firm as the everlasting hills."

Three teachers only, where we have forty, or nearly that number! But when the great University of Göttingen was established, the illustrious Haller filled the one Chair of Botany, Anatomy, Surgery, and Medicine. I call it a Chair,—it was rather a Settee of Professorships.

It is to be regretted that we have not a list of the textbooks in use during that first period of the School. Dr. Waterhouse would naturally refer his students to the learned Gaubius, the voluminous Van Swieten, the illustrious Boerhaave. The excellent Dr. Fothergill was his uncle; the immortal Jenner was his second creator, and their names, with that of Dr. Lettsom, were often on 'his lips. Sydenham, Pringle, and Cullen he speaks of as being in the hands of all his students, and his references show a considerable extent of reading.

The textbooks in anatomy were probably Cheselden and Monro, perhaps Winslow, and, for those who could French, Sabatier. The Professor himself had the magnificent illustrated works of Albinus and of Haller, the plates of Cowper (stolen from Bidloo) and others. The student may have seen from time to time, if he did not own, the figures of Eustachius and of Haller. Haller's First Lines of Physiology were doubtless in the hands of most students. The works of Pott, of Sharp, and most of all of John Hunter, were taking the place of Heister and the other earlier authorities.



Smellie was probably enough the favorite in his department. What chemical textbooks Dr. Dexter put into the hands of his students in 1783 I will not venture to conjecture.

And now I will ask you to take a stride of half a century, from the year 1783 to the year 1833. Of this last date I can speak from my own recollection. In April, 1833, I had been more than two years a medical student attending the winter lectures of this school, and have therefore a vivid recollection of the professors of that day. I will only briefly characterize them by their various merits; not so much troubling myself about what may have been their shortcomings. The shadowy procession moves almost visibly by me as I speak: John Collins Warren, a cool and skillful operator, a man of unshaken nerves, of determined purpose, of stern ambition, equipped with a fine library, but remarkable quite as much for knowledge of the world as for erudition, and keeping a steady eye on professional and social distinction, which he attained and transmitted; James Jackson, a man of serene and clear intelligence, well instructed, not overbook-fed, truthful to the centre, a candid listener to all opinions; a man who forgot himself in his care for others and his love for his profession; by common consent recognized as a model of the wise and good physician; Jacob Bigelow, more learned, far more various in gifts and acquirements than any of his colleagues; shrewd, inventive, constructive, questioning, patient in forming opinions, steadfast in maintaining them; a man of infinite good nature, of ready wit, of a keen sense of humor, and a fine literary taste; one of the most accomplished of American physicians; I do not recall the name of one who could be considered his equal in all respects; Walter Channing, meant by nature for a man of letters, like his brothers, William Ellery and Edward; vivacious, full of anecdote, ready to make trial of new remedies, with the open and receptive intelligence belonging to his name as a birth-right; esteemed in his specialty by those who called on him in emergencies. The Professor of Chemistry of that day was pleasant in the lecture room, rather nervous and excitable. I should say, and judiciously self-conservative, when an explosion was a part of the programme.

Those who are curious to know what handbooks we students used in 1833 will find they were nearly as follows: In anatomy, the works

of John and Charles Bell, that of Wistar, and the Dublin Dissector. In physiology, Haller's *First Lines* and Richerand. In chemistry, Webster's edition of Brande. In surgery, Samuel Cooper's work, with his *Surgical Dictionary* as a book of reference. In theory and practice, Dr. Good's *Study of Medicine* was adopted by Dr. James Jackson and generally followed. *Gregor's Practice* was often seen in the student's hands, and Laennec's *Treatise on Diseases of the Chest and Their Physical Signs* was just coming to their notice in the form of Dr. Forbes's Translation. Denman and Dewees were the favorites in their special branches. Bigelow's *Sequel to the Pharmacopoeia* was much sought after by the students of this school. Like the excellent and serviceable work recently published by his successor in the Chair of *Materia Medica*, it was unpretentious enough for the most scrupulous teachers of the high and dry northern latitudes.

Other works read by students were Hunter on the blood, Fordyce on fever, Heberden, and of course Cullen, and the earlier standards which happened to be in their instructors' libraries. Louis was just beginning to be known among us. The lectures of Sir Astley Cooper and of Mr. Abernethy were eagerly read. One fellow-student of mine read through the three solid quartos of Morgagni. These are the principal authorities I recall as lying about our study and lecture rooms. But my memory is, no doubt, sometimes at fault.

Great stories had been reaching us for some time of the schools and hospitals of Paris. Dr. John Jackson, nephew of our old Professor, came home with news of the fine opportunities there offered. Young James Jackson, the Professor's son, was there still, writing home letters which remain on published record, to show how much of talent, zeal, and high promise was lost to the medical profession by his early death. Especially did he speak of Louis, whom he had chosen as his principal teacher, and of whom he became the favorite pupil and the very dear friend. These circumstances decided me to seek the same centre of instruction, and so, in April, 1833, I left Boston to pursue my studies in Paris. Dr. John Jackson bade me farewell with a look as if I were indeed on my way to the good Bostonian's heaven, and handed me a small square of India-rubber, his own newly-suggested pleximeter, or instrument to be used for immediate percussion, which he

wished me to show to Louis and the other great Paris doctors.

I have said something of my Boston teachers, and I will devote a few words to those whose instructions I followed in Paris, and to their most renowned professional contemporaries in other European countries, at the risk of some repetition of what I have said elsewhere.

Old Boyer, Baron Boyer, who, in spite of his title, kept his own books for sale at his own house, was still creeping around the wards of La Charité. At Hotel Dieu was the great surgeon, Dupuytren. On the other side of the river was his large and loud rival, Lisfranc. Roux, best known by his report of his medical visits to England, was operating and lecturing.—lecturing, parenthesis within parenthesis.—ovum, germinal, vesicle, germinal spot, until his embryo meaning vanished in the invisible; Velpeau, a reclaimed rustic, who by sturdy industry grew out of his wooden shoes into an erudite author and teacher and a celebrated practitioner; Civiale, the inventor of lithotripsy; Ricord, whose mercurial temperament, to say nothing of his practice, displayed itself in his lively clinical promenades; these were some of the more famous surgical celebrities of fifty years since. Louis, Andral, Chomel, Rostan, Trousseau, Bouillaud were the best known teachers of clinical medicine. Cruveilhier was professor of anatomy in the École de Médecine, and Orfila, the handsome dean of the faculty, lectured upon some branches of medical jurisprudence. Two or three water-logged old professors were moored to their chairs; one of them not so very old, but with a good many barnacles about him; one formidable three-decker, Broussais, with his upper tier of guns still above the water-line, and banging away at the assailants of his famous "physiological doctrine." Some of the specialists I recall were Siebel in ophthalmology, Bielt in dermatology, Buboïs the younger, and a younger Baude-locque, inventor of a certain lemon-squeezer-like machine, about as threatening to the future of the race as the invention of that other medical practitioner, Dr. Guillotin.

The works in the hands of French students were those of the great teachers and practitioners just mentioned. Jules Cloquet's Anatomy was a favorite manual. Sabatier's and Maygrier's were sometimes met with. The much more extensive and thorough work of

Cruveilhier was a little later to come into common use. The great work of the same author on Pathological Anatomy was of a still later date. Bourgery's magnificent, somewhat dandified anatomy, if I may borrow this term, was in course of publication. Its showy figures were got up like opera dancers, primarily for anatomical study, and secondarily for aesthetic gratification. Magendie's Physiology had replaced that of Richerand. Boyer was still a leading authority in surgery. The name of Jean Louis Petit was frequently cited in the lectures of Marjolin, himself scarcely remembered at the present day. Bayle and Corvisart were giving place to Louis and Bouillaud. Laennec held his position as few inventors and discoverers can hope to do in the face of the after-comers who improve on their improvements.

What had been the most signal advances in the science and art of medicine between 1783 and 1833, the first half of the century we are considering?

In medical science the method of studying the human body by its constituent elements,—the General Anatomy of Bichat,—which is to common descriptive anatomy what geology is to geography, would still hold the first place if it could claim all that the microscope has done for it. It was at any rate a great onward movement, with far-reaching results for physiology and pathology.

Next to this would come the discoveries of Sir Charles Bell and Magendie of the distinct motor and sensitive functions of certain nerves and nerve-roots.

The most important practical achievement was the introduction of vaccination. I know that this practice has been and is even at the present day the subject of violent attacks and bitter prejudices. It is only very recently that our distinguished visitor—our fellow citizen,—by the female side,—the Right Honorable Sir Lyon Playfair, at home alike in the laboratory of science and when presiding over the deliberations of the British House of Commons, has had to defend it,—nobly and successfully he did it,—in that august assembly. There is always an unconvinced and irreclaimable minority. Those who believed not Moses and the Prophets would not believe though one rose from the dead to convince them. Most of us, I feel sure, are ready to say of Jenner's dis-

covery, borrowing some of Luther's words about justification by faith, that vaccination is a test *stantis vel cadentis medicinae*.

Laennec's invention of auscultation holds the next place to vaccination in the records of practical improvement during our first half century. The recognition of the affection of the kidneys known as "Bright's disease," and the separation of the too familiar and fatal malady, diphtheria, from those with which it was long confounded, are other notable advances made during the period in question.

If we compare the two half centuries, we may balance the following improvements against each other:

Against the discovery of the double nerve function the extended knowledge of the reflex function.

Against "general anatomy," the cell-doctrine, due to the discoveries made by the use of the achromatic microscope, to which we also owe the discovery of the minute organisms, so important in the history of disease.

Against vaccination we may offset surgical anaesthesia.

Against the stethoscope the medical thermometer.

We must divide the honors of lithotripsy and those of ovariectomy between the two periods.

The beneficial changes in the treatment of insanity effected by the earlier labors of Pinel and Esquirol have been admirably carried on in the more recent period.

Many other and not inconsiderable improvements in medical science and art had taken place in our first half century, as may be seen in Cuvier's Report on the Progress of Natural Sciences. But the last fifty years have been not less richly productive. I can only indicate in the briefest manner some few among their acquisitions.

Modern scientific chemistry is a mystery to us who were brought up in the old school of pyrotechnic experimenters. It seems to us to make over its theories and its nomenclature about once in ten or twenty years. But that may be our ignorance. We know as much as this, that our professors teach real and most valuable practical knowledge by making the student work, and work thoroughly, in the laboratory.

Physiology is a new science, we might almost say, since the perfecting of organic analysis, the invention of the achromatic microscope, and

of the numerous instruments of precision which record the vital actions and conditions.

Anatomy has aided the more exact study of regions and of sections to its earlier methods of investigation.

Operative surgery has of late years achieved its greatest triumph in the establishment of abdominal section as a legitimate and safe operation. First employed by an American surgeon, Dr. McDowell of Kentucky, in 1809, in the hands of Spencer Wells and his contemporaries it was rescued and is rescuing hundreds of lives. Tenotomy by subcutaneous section is another new and valuable operation. Plastic surgery has learned to patch deformities as a skillful housewife patches a garment. Limbs which would have been sacrificed are saved by improved methods of dressing, especially by the use of antiseptics. Resection of joints or of portions of the shaft of a bone has in many cases taken the place of amputation. Let me not forget the operation of paracentesis with aspiration of the thorax in acute pleurisy, as first practised by Dr. Henry Ingersoll Bowditch and Dr. Morrill Wyman. But enough has been said to show that the last half of our century has justified itself for existing. I shall return to some of these matters when speaking of the new edifice where they are to be subjects of instruction.

In the prevention of disease the gain has been extraordinary. The germ-theory, alluded to as one of the results of the perfecting of the microscope, has done much to account for the phenomena of many diseases and to indicate the means of arresting their development. The recognition of domestic malaria as the frequent source of disease is of vast importance. The phrase "drain fever" has saved hundreds of lives.

It is harder to speak of medical practice—the treatment of internal diseases, fevers, visceral inflammations and the like. The practice of drugging for its own sake, the fatal bequest of the English apothecary, or "general practitioner," whose profit was made on his medicine, had infected the medical profession of this country, as I believed, when some twenty and more years ago in guarded terms, often misquoted, I denounced it somewhat too epigrammatically for some of my friends of the Massachusetts Medical Society. Professor Gairdner of the University of Glasgow has recently used language much plainer than my innocent allu-

sion to the probable effect of sinking a cargo of miscellaneous drugs among the fishes. It has been objected, he says, "that the Scottish graduate in medicine was not sufficiently conversant with the details of compounding and dispensing powders, and pills, and mixtures, and above all draughts (at 2s 6d, a piece), to be taken two, three, four, or five times a day; in other words, that he had not sufficiently mastered the technical details by which his neighbor, the English apothecary, was able to accomplish the great ideal of the 'surgery-boy' type—the dispensing of immense quantities of 'physic' in the most complicated prescriptions, to pass unquestioned down the willing throats of Her Majesty's lieges." There can be little doubt that the practice thus originating influenced the whole professional public of England to a very considerable extent, and through that public introduced the over-drugging system into her colonial dependencies and the States which some of these became. However this may be, great changes have taken place within the later decades of my remembrance in the practice of medicine. Bleeding is an almost unknown operation. Of the four great remedies of Dr. Holyoke's and Dr. James Jackson's time, antimony has fallen from grace, and calomel, instead of being next the apothecary's right hand, as the letter E is to the printer's, has gone to an upper shelf, where it may be supposed to repent of its misdeeds like Simeon Stylites. Cotton Mather had said a century and a half ago, "I am not sorry that antimonial emetics begin to be disused." He said, too, more rhetorically, "Mercury, we know thee: but we are afraid thou wilt kill us, too, if we employ thee to kill them that kill us." This was a lively way of putting a thought long afterward made into a famous saying.

While old drugs and old methods have become obsolete, new drugs and new methods have come in to take their place. The first aphorism of Hippocrates, "life is short, art is long," and so on, is a glittering generality. The second aphorism is one of daily practical application, never to be forgotten, "Not only must the physician attend properly to his own duties, but he must see that the patient, the attendants, and all the external conditions are properly ordered." As the over-employment of drugs gives way to juster views, the hygienic conditions and personal attendance on the patient are like to be better cared for. The less the patient is annoyed with over-medication,—pain-

ful and disgusting remedies,—the more tractable he is like to be, and the less likely to throw his medicine out of the window, where it will kill the chickens instead of the fishes. The more attention is like to be paid to air and cleanliness and comfort, the more to the kind of nourishment and the modes and times of giving it. In proportion as the work of the apothecary diminishes, the cares of the nurse are called upon to render disease endurable by all the arts known to a skillful attendant. Little things meant a great deal in the sick room. "Will you have an orange or a fig?" said Dr. James Jackson to a fine little boy now grown up to goodly stature, and whom I may be fortunate enough to recognize among my audience of today. "A fig," answered Master Theodore, with alacrity. "No fever there!" said the good doctor, "or he would certainly have said an orange."

Now it is in just these little unimportant, all-important matters that a good nurse is of incalculable aid to the physician. And the growing conviction of the importance of thorough training of young women as nurses is one of the most hopeful signs of medical advancement. So much has been done and is doing that the days of the Sairey Gamps and Betsey Prigs are numbered. I cannot help saying in this connection that the Registry of Nurses fortunately connected with the Boston Medical Library, itself of comparatively recent formation, is a blessing to our community which can hardly be over-estimated. What is there in the hour of anguish like the gentle presence, the quiet voice, the thoroughly trained and skillful hand of the woman who was meant by nature and has been taught by careful discipline to render those services which money tries to reward but only gratitude can repay? I have always felt that this was rather the vocation of woman than general medical, and especially surgical, practice. Yet I myself followed a course of lectures given by the younger Madame Lachapelle in Paris, and if here and there an intrepid woman insists on taking by storm the fortress of medical education, I would have the gate flung open to her as if it were that of the citadel of Orleans and she were Joan of Arc returning from the field of victory. I have often wished that disease could be hunted by its professional antagonists in couples,—a doctor and a doctor's quick-witted wife making a joint visit and attacking the patient.—I mean the patient's mal-

ady, of course,—with their united capacities. For I am quite sure that there is a natural clairvoyance in a woman which would make her as much the superior of man in some particulars of diagnosis as she certainly is in distinguishing shades of color. Many a suicide would have been prevented if the doctor's wife had visited the victim the day before it happened. She would have seen in the merchant's face his impending bankruptcy while her stupid husband was prescribing for his dyspepsia and indorsing his note; she would recognize the love-lorn maiden by an ill-adjusted ribbon—a line in the features,—a droop in the attitude,—a tone in the voice,—which mean nothing to him, and so the brook must be dragged tomorrow. The dual arrangement of which I have spoken is, I suppose, impracticable, but a woman's advice, I suspect, often determines her husband's prescription. Instead of a curtain lecture on his own failings he gets a clinical lecture,—on the puzzling case, it may be of a neighbor suffering from the complaint known to village nosology as “a complication of diseases,” which her keen eyes see into as much better than his as they would through the eye of a small-sized needle. She will find the right end of a case to get hold of, and take the snarl out as she would out of a skein of thread or a ball of worsted which he would speedily have reduced to a hopeless tangle.

I trust I have not dwelt too long on this point, which grew out of my consideration of the great change which has so largely substituted the careful regulation of all the conditions surrounding the patient for the drugging system derived from the practice of the English “Apothecaries.” Like the Father of Medicine in the aphorism which I have quoted, we consider attention to these conditions entitled to precedence relatively to all active interference with the course of disease.

Yet we must not be ungrateful to the pharmacist for the useful agents, old and new, which he puts in our hands. Opium and cinchona appear in our modern pharmacopœia with all their virtues, but freed by chemical skill of the qualities which most interfered with their utility. Mercury is no longer considered a panacea, but is still trusted for important special services. Most of the remedial plants have yielded their essential principles to chemical analysis and have got rid of the useless portions which make them bulky and repulsive. Iodine,

bromine, salicine, in their various compounds have, within the present century, conferred inestimable aid in the treatment of some of the most formidable diseases. Many other new remedies, such as carbolic acid, glycerine, chloral, have been added to the list of those which are of daily use in combating particular symptoms, or are adapted to certain exceptional conditions. The method of administering remedies by inhalation has been greatly extended, and the admirable invention of the process of subcutaneous injection,—a method, I may remark, tried upon himself and made the subject of a thesis by the late Dr. Enoch Hale, a graduate of this school,—has become next to etherization, the most rapid and potent means of subduing pain and other forms of suffering. I need not speak of medical electricity, which has proved so serviceable in the treatment of nervous and muscular affections.

I despair of enumerating all the improvements which have been effected in the various specialties into which the practice of medicine has become subdivided with these 20 or 30 years. The ophthalmoscope, the improved ear speculum, the rhinoscope, the laryngoscope—hold out their mirrors to enlighten us, or open their mouths to proclaim their own value. Diagnosis has reached a wonderful degree of accuracy; prognosis has become a terrible kind of second-sight which is not always handled carefully enough; treatment gains a little with every decade. The history of therapeutics records a succession of marches and counter-marches, with a slight onward movement as the total result of every completed revolution; slight, but precious to humanity.

I cannot pass over the most encouraging fact of the growth of medical libraries. We have a right to congratulate ourselves on the prosperity of that which has sprung into existence in this city within the last few years. It seems to me to mark the beginning of a new era in the medical history of the city. But what can I say of the immense library formed, but always forming, at Washington, and how can I sufficiently praise the work of Dr. Billings and his associates, one of the results of which comes before us in that colossal catalogue which is one of the best proofs of the advancing civilization of the great Republic?

It was time for the Medical School of Harvard University,—of that institution of which Massachusetts must always be proud so long as

she has anything to be proud of.—it was time for this school to plant its chief edifice in a fairer position, and erect it on a broader foundation than those with which it has been so long obliged to be contented. Let us not be ungrateful to the memory of our earlier benefactors; to the State for the grant which proved of such value in its time; to the individuals who gave land and money when the former buildings were constructed. But the little Mason street building was long ago outgrown, and that which succeeded it in turn became wholly insufficient for the needs of the school.

You will pass from beneath this hospitable roof to the new edifice in which as we trust many successive generations of medical students are to receive a large part of their instruction. As you enter its doors, as you survey its halls and lecture-rooms, its laboratories, and their appliances, some of you may be ready to exclaim, What! All this to teach a student to cut off a limb or administer a potion?

The question is a natural one, and the answer is easy. The art of healing is supported, advanced, illuminated, by the various kinds of knowledge which are recognized as belonging to the science of medicine. And the science of medicine, like all other kinds of classified knowledge, is best taught, most easily and thoroughly learned, when taught systematically, because facts are most clearly perceived and most firmly retained in the memory when presented in their serial relations. The teaching of the various branches included in a complete medical course requires ample provision for its multiplied exigencies.

You will enter or look into more amphitheatres and lecture-rooms than you might have thought were called for. But if you knew what it is to lecture and be lectured to in a room just emptied of its preceding audience, you would be thankful that any arrangement should prevent such an evil. The experimental physiologists tell us that a bird will live under a bell glass until he has substituted a large amount of carbonic acid for oxygen in the air of the bell glass. But if another bird is taken from the open air and put in with the first, the new-comer speedily dies. So when the class I was lecturing to was sitting in an atmosphere once breathed already, after I have seen head after head gently declining and one pair of eyes after another emptying themselves of in-

telligence, I have said, inaudibly, with the considerate self-restraint of Musidora's rural lover,—

Sleep on, dear youth; this does not mean that you are indolent, or that I am dull; it is the partial coma of commencing asphyxia.

You will see extensive apartments destined for the practical study of chemistry and of physiology. But these branches are no longer studied as of old by merely listening to lectures. The student must himself perform the analyses which he used to hear about. He must not be poisoned at his work, and therefore he will require a spacious and well-ventilated room to work in. You read but the other day of the death of an esteemed fellow-citizen from inhaling the vapors of a broken demijohn of a corrosive acid. You will be glad to see that every precaution is taken to insure the safety and health of our students.

Physiology, as now studied, involves the use of much delicate and complex machinery. You may remember the balance at which Sanctorius sat at his meals, so that when he had taken in a certain number of ounces the lightened table and more heavily-weighted philosopher gently parted company. You have heard, perhaps, of Pettenkofer's chamber, by means of which all the living processes of a human body are made to declare the total consumption and product during a given period. Food and fuel supplied; work done. Never was the human body as a machine so understood; never did it give such an account of itself as it now does in the legible handwriting of the cardiograph, the sphygmograph, the myograph, and other self-registering contrivances, with all of which the student of today is expected to be practically familiar.

I do not see any room marked on the plan of the new building as intended especially for the use of the microscope. But that a proper apartment will be assigned to this use I feel assured. I have referred to the modern achromatic microscope as having created a new era in medical science. I have no time to tell what it has done for anatomy, physiology, and pathology, besides its great services in other departments of knowledge. But to those who have never seen its miracles I can give an illustration which they will find it hard to believe I did not borrow from some new Gulliver's Travels or from some Jules Verne's imagination. Yet what I shall say is the simplest truth in the world to

any microscopic expert, and may be easily verified by any sceptic.

If we had to examine the structure of a human body by the naked eye,—or as I will venture to call it, gymnoscopia or rather gymnopia inspection,—it would make a great difference whether our subject were of the natural dimensions or whether he were a Liliputian, or a Brobdingnagian. We should lose sight of many particulars in the structure of the Liliputian which we easily detect in a man of the natural size. We should find many things plain enough in the Brobdingnagian which we do not notice in the man of ordinary dimensions on account of their minuteness. Thus, for instance, we should find that man is shingled all over, or tiled, if you will—covered with scales, more literally, just as a serpent is. The statue of Liberty, the arm of which the east in the square at New York has made familiar to us; the statue of Carlo Borromeo at Milan, that of Bavaria, or the new statue of Germania, any one of these changed to flesh and blood would be a great source of knowledge to a gymnopia anatomist. You will observe that the naturalist could examine only a small portion of one of these colossal figures at a time. Of course the same thing is true of the microscopic man I am going to describe. He must be examined in small fragmentary portions.

The individual from whom we will suppose the portion under examination to have been taken was, we will say, of short stature; a little more than five feet, two inches in height, and weighing one hundred and twenty pounds. Our microscope, a rather powerful, but not extraordinarily powerful one, magnifies a thousand diameters. This fragment, then, thus magnified, represents an individual just one mile in height. He would ten times overtop the loftiest of the pyramids; twenty times the tallest of our steeples. He would bstride our good city from Long Wharf to Charles street. His breadth and thickness being in proportion to his height, his weight would be 120,000,000,000 (one hundred and twenty thousand million) pounds, equal to sixty million tons. He could take our State House up as we would lift a paving stone and fling it into the waters beyond Boston Lighthouse,—cleaning out that palace of the people by a summary process quicker than the praetorian hands of Domitian or Commodus would have cleaned out a Roman Senate Chamber that dared to have an opinion of its own.

Such is the microscopic man as we see him piecemeal in that wonderful instrument. It is the telescope of the microcosm—the master-key to the portals of a new universe, and the student must be carefully taught how to use it.

Among the various apartments destined to special uses one will be sure to rivet your attention, namely, the anthropotomic laboratory, known to plainer speech as the dissecting room. The most difficult work of a medical school is the proper teaching of practical anatomy. The pursuit of that vitally essential branch of professional knowledge has always been in the face of numerous obstacles. Superstition has arrayed all her hobgoblins against it. Popular prejudice has made the study embarrassing and even dangerous to those engaged in it. The surgical student was prohibited from obtaining the knowledge required in his profession and the surgeon was visited with crushing penalties for want of that necessary knowledge. Nothing is easier than to excite the odium of the ignorant against this branch of instruction and those who are engaged in it. It is the duty and interest of all intelligent members of the community to defend the anatomist and his place of labor against such appeals to ignorant passion as will interfere with this part of medical education, above all, against such inflammatory representations as may be expected to lead to midday mobs or midnight incendiarism.

The enlightened legislation of Massachusetts has long sanctioned the practice of dissection, and provided means for supplying the needs of anatomical instruction, which managed with decent privacy and discretion, have served the beneficent purpose intended by the wise and humane law-givers without doing wrong to those natural sensibilities which are always to be respected.

During the long period in which I have been a professor of anatomy in this medical school, I have had abundant opportunities of knowing the zeal, the industry, the intelligence, the good order and propriety with which this practical department has been carried on. The labors superintended by the demonstrator and his assistants are in their nature repulsive, and not free from risk of disease, though in both these respects modern chemistry has introduced great ameliorations. The student is breathing an air which unused senses would find insufferable. He has tasks to perform which the chambermaid and the stable-boy would shrink from under-

taking. We cannot wonder that the sensitive Rousseau could not endure the atmosphere of the room in which he had begun a course of anatomical study. But we know that the great painters, Michel Angelo, Leonardo, Raphael, must have witnessed many careful dissections; and what they endured for art, our students can endure for science and humanity.

Among the large number of students who have worked in the department of which I am speaking during my long term of service,—nearly two thousand are on the catalogue as graduates,—there must have been some who were thoughtless, careless, unmindful of the proprieties. Something must be pardoned to the hardening effect of habit. Something must be forgiven to the light-heartedness of youth, which shows itself in scenes that would sadden and solemnize the unseasoned visitor. Even youthful womanhood has been known to forget itself in the midst of solemn surroundings. I well remember the complaint of Willis, a lover of the gentle sex, and not likely to have told a lie against a charming young person;—I quote from my rusty memory, but I believe correctly: She trifled! ay, that angel-maid,—

She trifled where the dead was laid.

Nor are older persons always so thoughtful and serious in the presence of mortality as it might be supposed they would show themselves. Some of us have encountered Congressional committees attending the remains of distinguished functionaries to their distant place of burial. They generally bore up well under their bereavement. One might expect to find them gathered in silent groups in the parlors of the Continental Hotel or the Breyvoort House; to meet the grief-stricken members of the party smileless and sobbing as they sadly paced the corridors of Parker's, before they set off in a mournful and weeping procession. It was not so; Candor would have to confess that it was far otherwise; Charity would suggest that Curiosity should withdraw her eye from the keyhole. Humanity would try to excuse what she could not help witnessing; and a tear would fall from the blind eye of Oblivion and blot out their motel bills forever.

You need not be surprised, then, if among this large number of young men there should have been now and then something to find fault with. Twice in the course of thirty-five years I have had occasion to rebuke the acts of individual students, once in the presence of the

whole class, on the humane and manly sympathy of which I could always safely rely. I have been in the habit of considering myself at liberty to visit the department I am speaking of, though it had its own officers; I took part in drawing up the original regulations which governed the methods of work; I have often found fault with individuals or small classes for a want of method and neatness which is too common in all such places. But in the face of all peccadillos and of the idle and baseless stories which have been circulated, I will say, as if from the chair which I no longer occupy, that the management of the difficult, delicate, and all-important branch committed to the care of a succession of laborious demonstrators, as I have known it through more than the third of a century, has been discreet, humane, faithful, and that the record of that department is most honorable to them and to the classes they have instructed.

But there are better things to think of and to speak of than the false and foolish stories to which we have been forced to listen. While the pitiable attempt has been making to excite the feelings of the ignorant against the School and University, hundreds of sufferers throughout Christendom,—throughout civilization,—have been blessing the name of Boston and the Harvard Medical School as the source from which relief has reached them for one of the gravest injuries, and for one of the most distressing of human maladies. I witnessed many of the experiments by which the great surgeon who lately filled a chair in Harvard University has made the world his debtor. Those poor remains of mortality of which we have heard so much have been of more service to the human race than the souls once within them ever dreamed of conferring. Dr. Bigelow's repeated and searching investigations into the anatomy of the hip-joint showed him the band which formed the chief difficulty in reducing dislocations of the thigh. What Sir Astley Cooper and all the surgeons after him had failed to see, Dr. Bigelow detected. New rules for reduction of the dislocation were the consequence, and the terrible pulleys disappeared from the operating amphitheatre. Still more remarkable are the results obtained by Dr. Bigelow in the saving of life and the lessening of suffering in the new method of operation for calculus. By the testimony of those renowned English surgeons, Sir Henry Thompson and Mr. Eriksen, by the



award of Dr. Bigelow of a sexennial prize founded by the Marquis d'Argenteuil, and by general consent, this innovation is established as one of the great modern improvements in surgery. I saw the numerous and patient experiments by which that priceless improvement was effected, and I cannot stop to moan over a scrap of integument, said to have been made imperishable; when I remember that for every lifeless body which served for these experiments a hundred or a thousand living fellow-creatures have been saved from unutterable anguish, and many of them from premature death.

You will visit the noble hall soon to be filled with the collections left by the late Professor John Collins Warren, aided by other contributors, and to the care and increase of which the late Dr. John Jackson of precious memory gave many years of his always useful and laborious life. You may expect to find there a perfect golgotha of skulls, and a platoon of skeletons, open to the sight of all comers. You will find portions of every human organ. You will see bones softened by acid and tied in bow-knots; other bones burned until they are light as cork and whiter than ivory, yet still keeping their form; you will see sets of teeth from the stage of infancy to that of old age, and in every intermediate condition, exquisitely prepared and mounted; you will see preparations that once formed portions of living beings now carefully preserved to show their vessels and nerves; the organ of hearing exquisitely carved by French artists; you will find specimens of human integument, showing its constituent parts in different races; among the rest, that of the Ethiopian, with its cuticle or false skin, turned back to show that God gave him a true skin beneath it as white as our own. Some of these specimens are injected to show their blood vessels; some are preserved in alcohol; some are dried. There was formerly a small scrap, said to be human skin, which had been subjected to the tanning process, and which was not the least interesting in the series. I have not seen it for a good while, and it may have disappeared, as the cases might happen to be open while unscrupulous strangers were strolling through the museum. If it has, the curator will probably ask the next poor fellow who has his leg cut off for permission to have a portion of its integument turned into leather. He would not object, in all probability, especially if he were promised that a wallet for his pocket, or a slip-

per for his remaining foot, should be made from it.

There is no use in quarrelling with the specimens in a museum, because so many of them once formed a part of human beings. The British Government paid fifteen thousand pounds for the collection made by John Hunter, which is full of such relics. The Hunterian Museum is still a source of pride to every educated citizen of London. Our foreign visitors have already learned that the Warren Anatomical Museum is one of the sights worth seeing during their stay among us. Charles Dickens was greatly interested in looking through its treasures, and that intelligent and indefatigable hard worker, the Emperor of Brazil, inspected its wonders with as much curiosity as if he had been a professor of anatomy. May it ever remain sacred from harm in the noble hall of which it is about taking possession! If violence, excited by false outeries, shall ever assail the treasure house of anthropology, we may tremble lest its next victim shall be the home of art, and, ignorant passions once aroused, the archives that hold the wealth of literature perish in a new Alexandrian conflagration. This is not a novel source of apprehension to the thoughtful. Education, religious, moral, intellectual, is the only safeguard against so fearful a future.

To one of the great interests of society, the education of those who are to be the guardians of its health, the stately edifice which opens its doors to us for the first time today is devoted. It is a lasting record of the spirit and confidence of the young men of the medical profession, who led their elders in the brave enterprise, an enduring proof of the liberality of the citizens of Boston and of friends beyond our narrow boundaries, a monument to the memory of those who, a hundred years ago, added a School of Medicine to our honored, cherished, revered university, and to all who have helped to sustain its usefulness and dignity through the century just completed.

It stands solid and four-square among the structures which are the pride of our New England Venice,—our beautiful metropolis, won by well-directed toil from the marshes and creeks and lagoons which were our inheritance from nature. The magnificent churches around it let in the sunshine through windows stained with the pictured legends of antiquity. The student of nature is content with the white rays that

show her just as she is; and if ever a building was full of light,—light from the north and the south; light from the east and west: light from above, which the great concave mirror of sky pours down into it; this is such an edifice. The halls where Art teaches its lessons and those where the sister sciences store their collections, the galleries that display the treasures of painting and sculpture, are close enough for agreeable companionship. It is probable that in due time the public library with its vast accumulations will be next-door neighbor to the new domicile of our old and venerable institution. And over all this region rise the tall landmarks which tell the dwellers in our streets and the traveller as he approaches that in the home of science, arts, and letters, the God of our fathers is never forgotten, but that high above these shrines of earthly knowledge and beauty are lifted the towers and spires which are the symbols of human aspiration ever looking upward to Him, the Eternal, Immortal, Invisible.

### Original Articles.

#### NOTES ON USE OF OBSTETRICAL FORCEPS.

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IN this paper it is the purpose of the writer to give definite directions for use of forceps in obstetrics. My experience at the hospital with house surgeons and in private practice as a consultant, leads me to the conclusion that the mistakes in operative obstetrics are made because of failure, on the part of the operator, to grasp the fundamental theoretical and practical principles underlying the application of forceps.

If this paper will make these principles more clear, then I shall feel justified in taking up space in the JOURNAL.

#### Indications for Forceps.

Any disproportion between size of pelvis and presenting part; any abnormal position of presenting part; abnormal shape of pelvis as well as abnormal size of pelvis; faulty position of uterine (preventing head entering brim).

*In Interests of Child.* Disturbance in rhythm of foetal heart; increased rapidity or slowing; rapidly increasing caput, or other signs of increased pressure; prolapsed cord.

*In Interests of Mother.* Uterine inertia (dis-

tinguish from inertia of recti muscles); inter-partum hemorrhage; eclampsia; heart disease (where physical strain may do injury); rigid pelvic floor; signs of maternal exhaustion.

#### Contra-Indications.

Such disproportion between pelvis and foetus, as to give rise to reasonable doubt as to ability to deliver living baby (smallest sized conjugate, justifying forceps is  $3\frac{1}{4}$  inches); hydrocephalus; monstrosities of certain types; inter-current disease, which might obviate operative procedure.

#### Classification of Forceps.

*High Forceps.* Floating head or head just engaged in brim.

*Median or Low Forceps.* Head well engaged in brim to floor of perineum. (May divide this into median A and B, depending upon level in pelvis.)

*Low Forceps.* Presenting part on perineum (through inter-spinal diameter).

#### Type of Forceps.

*"Ordinary."* Have both a cephalic and pelvic curve and traction is made from shanks or handles. (Ones usually used.)

*Straight.* Have only a cephalic curve and are applicable for very low work.

*Fenestrated.* Open fenestra in blades.

*Solid.* Blades one solid piece, no opening (uncommon in this section).

*Axis-traction.* Should be used on any high or median which is hard. When ordinary forceps are placed on a head which is above brim or high in excavation, the handles point towards floor and low on perineum. Traction, in this position is difficult to exert in proper direction. With patient on table in lithotomy position the axis of inlet is nearly a horizontal direction, while the axis of outlet is at a tangent; with the axis of the cavity of pelvis describing an arc on the symphysis as a center; thus it can be seen that the line of traction must shift, to conform with the anatomical variations. Therefore, with a head at the brim, the traction must be downward in order to bring head into excavation and, as said above, this line of traction is difficult by direct pull on handles of forceps. To overcome this difficulty, rods have been inserted at base of blades so that any force exerted is from this point and no matter what the position or level of operator's hands, on handles of traction rods, the axis of traction remains the same and in the lithotomy position, this is

downward and backward. This downward traction should be continued until the head is well down and then it should be remembered that we desire our force to be outward until floor of perineum begins to bulge, when traction is in curve of Carus. With these latter principles in mind, use of axis-traction rods should be discontinued after head is well into excavation. When in low stage, some operators like to shift to a smaller and lighter type of forceps because bulk of axis-traction forceps are more apt to overstretch perineum. In taking off forceps, for any reason, same care should be taken as in the application, lest we injure soft parts; and, as a rule, the last blade applied is removed first.

*Anesthesia.* It is usual to place patient under complete anesthesia, but some operators let patient run "light" in order to get the benefit of natural uterine contractions. Incomplete anesthesia should always be used in a case of true uterine inertia because of increased liability to post-partum hemorrhage in this condition. If operator is in doubt as to line of traction it is well to let patient recover until uterine contractions recur and then see direction in which handles of locked forceps move.

#### *Conditions Necessary for Forceps.*

Complete cervical dilatation; ruptured membranes; exact knowledge of presenting part and position of this part: no such disproportion or anatomical anomaly as to prevent delivery.

#### *Position of Patient.*

Lateral or side, with limbs flexed on abdomen.

Lithotomy or on back (most common in this section of the country). If lithotomy position is used, with limbs flexed on abdomen or held in stirrups, true conjugate is made smaller and therefore in high forceps Walcher's position should be used. This position increases conjugate about one-fourth of an inch, which may be vital in a tight-fitting case; it is obtained by fixing sacrum firmly at edge of table, not over edge and allowing limbs to drop prone to each side. While using this position to enlarge inlet it must be remembered that it also lessens size of outlet, therefore, after head is well into excavation (and shoulders in some cases) we should flex limbs again on abdomen, increasing diameter of outlet.

#### *General Rules of Technique.*

Examine patient just before introduction of forceps, and ascertain if primary conditions for application are present, *viz.*, full cervical dilata-

tion; ruptured membranes; position of presenting part.

Lock forceps outside vulva. Choice of blades, right or left, may depend on position of head, but in general remember right blade locks on top of left and first blade inserted lies below second; therefore, if right blade is introduced first it will have to be rotated or manipulated until it lies on top of left and thus be in position to lock. This may be difficult and result in damage to soft parts, therefore it is a good general rule to introduce left blade first.

In introducing blades use no force. If insertion is made correctly blades will almost fall into place.

*Method of Introduction.* Two general methods: (1) Forceps held so that handles rest in patient's groin and tip enters vagina and then allowed to "wander" into place; (2) forceps held so that handle is over abdomen in line with umbilicus and tip enters vagina, meeting presenting part, and then "wanders" into place. No particular advantage in either.

*Cephalic and Pelvic Application.* We can use either of these applications, a combination of the two, and one which is neither pelvic nor cephalic.

Cephalic application is the ideal and one that should be strived for in every case, though not always possible of accomplishment. In this type we proceed as follows: Examining hand enters vagina until head is made out: if cervix is not fully dilated, it is now dilated to full and fingers of hand inserted between cervix and head. Search is now made for ear, position of latter is noted, when found, and also direction in which helix of ear points. If helix points towards left and upward we know that position must be O-L-A, because helix points towards occiput and thus occiput must be to left and anterior: proper blade is selected and tip inserted, as directed in previous part of paper, until presenting part is met: then blade is guided by examining fingers until cephalic curve of blade fits over parietal bone. Same procedure is carried out with other blade and blades locked, bringing cephalic curve of both blades over parietal bones, and therefore line joining tips is in bi-parietal diameter, the ideal application; and, let me repeat, this is accomplished by direct guidance of forceps into a definite position by the operator.

Pelvic application is where the forceps are introduced in such a manner that the pelvic curve

of the forceps follows the curve of maternal pelvis; and, when locked, the points of contact between forceps and head are a matter of good fortune and not ones definitely chosen by operator. This application usually results in an oblique diameter being grasped. A pelvic and cephalic combination is obtained only when head is directly antero-posterior, which is not common except in a very low forceps. In this case the sagittal suture is directly antero-posterior and at the same time at right angles to transverse diameter of pelvis; therefore, line joining tips of blades in a pelvic application is at right angles to sagittal suture and in bi-parietal diameter.

Inability to apply forceps, either by cephalic or pelvic application, may be encountered, and such a case as a transverse where it is impossible by reason of promontory of sacrum or pubes to make a cephalic application and we do not wish to make a pelvic, then we apply forceps in an oblique diameter. A true cephalic application is best, *i.e.*, line joining tips parallel to bi-parietal diameter, and thus least compression to foetal head, least danger of slipping, less danger of injury to soft parts of mother and child. Oblique is second choice, *i.e.*, line joining tips of blades parallel to one of the long oblique diameters, and thus compression is not as much as in occipito-frontal diameter; danger of slipping not as great as in latter. Third, is pelvic application in transverse position. This is the worst application and one to be avoided, and one that is avoidable. In this application we have tips of blades in line of sagittal suture, with one blade over frontal bone and the other over occipital; this gives undue pressure on head, great liability to slipping and great danger of injury to child's face.

#### *Application to Occiput in Various Positions*

**O-L-A.** Left blade is posterior; right blade anterior, tips of blades point toward left; sagittal suture in right oblique diameter of pelvis.

Right hand or fingers of right hand, depending upon level of head in pelvis, are placed in vagina and allowed to ascend until they meet head; if head is well up, examining hand is placed between cervical tissue and head, and if at this time it is found that cervix is not fully dilated, it must be attended to at once. Search is now made for left ear, which is posterior, and finding it, verify position by noting direction in which helix points, if O-L-A, helix of ear points towards left side and upward. Now

grasp handle of left blade lightly with left hand, introduce into vagina, as directed in previous part of paper, and allow tip of blade to run along palmar surface of hand or fingers until cephalic curve of blade can be fitted directly over posterior ear; repeat manoeuvre on right side, remembering, in this case, right ear is anterior; lock forceps, and if blades are in proper position they will lock with ease and with shanks in close approximation. If they do not lock with ease, or if handles are far apart, you probably have not a good application, as probably the left blade shifted from its ideal location during the introduction of the right blade and it is well to remove the right blade, reexamine position of left and reapply right blade; assuming that blades lock properly, before exerting traction examine once again and thus make doubly sure of your position of cephalic curve of blades. During these manipulations do not use force; if guiding hand or fingers are in proper place and tips of forceps run along fingers as guides, they should "wander" into place without trouble and when obstruction is encountered, it is usually due to tip getting caught in fold of vagina, child's scalp or in cervical cul-de-sac, and thus outside rim of cervix (reason why care should be taken fully to dilate cervix and be sure guiding fingers are within cervical rim): in case of obstruction, withdraw blade an inch or two and then move forward again; if obstruction still persists, withdraw blade outside vulva and reexamine, with care, to ascertain the cause: *do not use force* to push blade by obstruction. Assuming application is satisfactory, traction is now exerted by grasping forceps shanks firmly with hand, arms, and elbows close to sides, not with arms extended and body thrown backward; fingers of free hand rest against head, especially in first few tractions, to make sure head is descending and not forceps slipping over head; traction in mid forceps is downward and outward until bi-parietal diameters are by inter-spinal line; then forward and outward until perineum begins to bulge and small fontanelle appears under pubes; then upward and forward in curve of Carns until complete delivery (theory of line of traction discussed more at length under Axis-Traction). When head begins to crown it is well to remove forceps blades (some do not remove blades); the last blade applied should be removed first, and in its removal care must be exercised not to damage soft parts. During de-

livery traction must be intermittent and not too prolonged at any one period, but simulate natural labor pains as near as possible; during intermissions the blades should be loosened to relieve pressure on child's head. When head is on perineum every precaution should be taken to protect latter, as some tear is the rule, and severe lacerations may take place if careless or too much traction is used and if good vision of perineal field is obscured by vaginal discharge, and thus the beginning of a tear not observed.

In the pelvic application of an O-L-A, forceps are introduced as above, but are not applied to head by direct guidance of hand into a known position but "wander" into pelvis, conforming to pelvic curve of maternal pelvis, and when locked we trust to good fortune that cephalic curve of forceps will approximate child's head in a "fair" position, and this is usually an oblique application; that is, one blade is slightly anterior to ideal position and is thus over a portion of occipital bone, and right blade is slightly posterior over temporal bones; line joining tips of blades is in long oblique diameter. As said in previous part of paper, this application is most common and is better than transverse application but with a long or hard "pull" it is more liable to slipping of blades and undue compression of foetal head than a cephalic application. Traction with remissions is practised as for cephalic; but during remissions, when forceps are loose, we may be fortunate and get a rotation within forceps, so that on relocking, find shanks come closer together as a result of more perfect coaptation of cephalic curve of blades to bi-parietal diameter. Delivery is accomplished as above.

**O-R-A.** In a right anterior position the right ear is posterior and left ear anterior, the opposite of O-L-A; tips of blades point towards right and sagittal suture is in left oblique diameter. In applying blades we have two choices, right or left blade first. If left blade is introduced first as a cephalic application, it will "wander" anterior; right will "wander" posterior; this application is easier as blades lock at once, and in a tight fit this may be a great advantage. If right blade is inserted first, it is guided by left hand, and after application to desired position, left blade is introduced; but now we have left blade above right and thus in no position to lock, so that in order to lock, right blade must be rotated

around left until handle of latter comes below right, or left must be so depressed that same result is accomplished. These manipulations may lead to severe laceration and injuries to both mother and child, and I, therefore, recommend introducing left blade first, as in O-L-A, under ordinary conditions. Traction, etc., as above, in O-L-A.

**O-D-P.** This position is one of the bugbears of obstetrics and the treatment of which varies with different obstetricians. I will try to give a résumé of all possibilities.

With occiput posterior and to the right, we have the sagittal suture in the right oblique pelvic diameter; the head usually, in some degree, extended and the largest diameters of foetal head occupying the smallest diameters of maternal pelvis. In connection with our other difficulties we have, usually, a large caput from long continued pressure and an exhausted mother from long continued labor. Our first choice of procedure should be to change the R-O-P to an R-O-T, or better, to R-O-A, by manual rotation or posture treatment (this latter I have had little success with); manual rotation is accomplished in this manner: left hand is introduced into vagina until head can be firmly grasped, with hand so rotated that fingers grasp posterior surface and thus palmar aspect of hand is pointed upward and to the right; if head is impacted, impaction is broken up by gentle manipulation and then occiput is rotated towards right side to an R-O-T or R-O-A; this is facilitated by right hand or assistant pushing on shoulders and buttocks of child through abdominal wall. With head now rotated to O-R-A, hold it, if possible, in this position by pressure through abdominal wall or by vaginal hand and apply forceps for this R-O-A position in usual way. Unfortunately the head does not always stay "put" after manual rotation and we find that during relaxation of grasp, incident to application of forceps, that head has rotated back to O-D-P. If, after reasonable attempts have been made to apply forceps to rotated head we find it impossible to retain it in its new position, then some other form of procedure must be taken. This same applies to R-O-T position, where head cannot be retained long enough to obtain a good application of forceps.

We can now consider rotating head to hollow of sacrum and thus assuming a direct an-

tero-posterior position with occiput posterior and with a pelvic application delivering child. As said in previous part of paper, pelvic application in this position will give a good application but we have the added danger of perineal laceration, if care is not taken. In this regard let me say that though theoretically a posterior occiput delivered as such will inevitably result in deep perineal lacerations, because the largest diameters of foetal head rest on perineum, my personal experience is that this is not true; if we recognize our position and deliver with extreme care, allowing the occiput to come over perineum slowly and thus allow soft tissues a chance to stretch, our laceration is no more than in anterior position: I realize that this is a strong statement, but my belief is that the deep perineal lacerations in posterior positions are due, not so much to the large occipital diameter as to failure to recognize the position and to too rapid a delivery. Assuming neither of the above procedures is possible, we must then proceed with head as persistent right occipital posterior. In this latter position, with head well up on perineum, in excavation or just through brim (higher positions will be discussed under High Forceps), we have a choice between forceps reversed and Scanzoni manoeuvre.

*Forceps Reversed.* In this application, tips of forceps point posterior, towards occiput, and are applied with difficulty: first, because it has technical difficulties in its application, but mainly because it is the reverse of the ordinary and is done so seldom that few become dextrous in its application. In the introduction of blades, forceps are locked outside the body and then reversed so that they now assume position as when application is complete; right hand is inserted into pelvis and locates posterior ear, which is right ear; handle of right blade is then grasped with left hand and inserted first, cephalic application being made as before directed; left hand is then introduced and left or anterior ear located; left blade is then grasped by right hand and application completed, bringing last or left blade above first or right blade, so that lock comes in proper position. It will be noticed that this is the reverse of the anterior applications and thus may be difficult to grasp, at first reading. Traction is now exerted downward until head is well into cavity of pelvis; from this time on, with each traction, forceps are rotated towards

mother's right until, with good fortune, head still within the forceps has been rotated to a direct anteroposterior position, with occiput anterior and low on perineum and is delivered as an anterior occiput, without change in original application of forceps. During this traction and rotation, the tips pointing first towards perineal floor and later transverse and then anterior, are likely badly to lacerate soft tissues of mother and should only be attempted after due consideration of difficulties and dangers involved.

The double application or Scanzoni is, under most circumstances, the better choice, and is accomplished as follows: In the first step, forceps were applied as for an O-L-A, which brings tips of blades pointing towards child's face (not occiput) and anterior; left blade of forceps being over posterior or right ear and right blade over anterior of left ear; traction is now made downward until head is well into cavity of pelvis, when rotation is made with each traction, to bring occiput into R-O-T and then R-O-A. When this latter position is reached, tips of forceps have assumed a posterior direction and forceps are now removed and re-applied as for a normal R-O-A position and delivery completed as for this position.

Though I believe this double application is superior to the reverse forceps, it is also one that is difficult and must be done with care and with full realization that injuries to mother and child are common and can be avoided only by gentle, careful manipulation of forceps.

*O-L-P.* An occiput left posterior is very uncommon; in fact, I do not recall ever meeting one, but the treatment is the same as for O-D-P, only rotation of occiput will be made towards left instead of right, and when forceps are applied in reversed position the right blade will be anterior over right ear (anterior ear in this position); and left blade is applied last and thus on top and is over posterior or left ear. Traction same as in O-D-P, only rotation to left.

Scanzoni in O-L-P brings first left blade anterior over right ear and right blade posterior over left ear, with tips pointing anterior and towards the right. Traction with rotation towards left until O-L-A is reached, and then removal of forceps and delivery as O-L-A.

In an O-L-P position some men have advocated rotation, not to left and O-L-A, but to right and through 90° to O-R-A; application

and traction are same for this, axis of rotation alone differing.

*Transverse Position.* In this condition occiput points either towards right or left, with sagittal suture parallel to transverse diameter of pelvis; in this position a pelvic application is contra-indicated and we must use a cephalic. The ideal cephalic application or bi-parietal will bring one blade of forceps under pubes and other over sacrum and by reason of the anatomical conformation of the pelvis, the symphysis or promontory of sacrum may act as bar to the proper bi-parietal application and, in this case, we may make an oblique application by direct guidance of cephalic curve of blades. Since, in my experience, the R-O-T is more common than L-O-T, I will describe the former.

*R-O-T.* Attempt should be made first, to do manual rotation to R-O-A and, that failing, apply forceps. Tips of blades, when applied, point to the right; left blade applied first and is anterior in oblique diameter; cephalic curve of blade lies over left half of temporal bone; right blade posterior over right part of occipital bone. Traction and rotation to O-D-A and delivery as such, as described above. In L-O-T, same thing, only reversed; occiput points towards left; tips of blades point towards left; left blade is posterior and right blade anterior; oblique application as with R-O-T and traction and delivery after rotation to O-L-A.

### *High Forceps.*

*Conditions Necessary.* Full dilatation of cervix; no great disproportion between size of head and pelvis; outlet which is normal or large enough to permit delivery; conjugate at least  $3\frac{1}{4}$  inches; urgent indication for termination of labor on part of mother or child; full realization of the difficulties and dangers of this operation.

Floating head presupposes inability of head to enter brim and therefore before forceps are attempted, careful examination should be made to be sure no such disproportion exists as to preclude delivery of living child. Wise to consider version, with floating head, if pelvis is normal in size.

*Technic.* Through completely dilated cervix, grasp head with right hand and rotate to O-D-A or O-L-A, or direct antero-posterior position, using ear as guide to position; make cephalic application, with same technic as in

mid position, only be persistent in trying for a good bi-parietal application and if this fails get at least a good oblique application, remembering that with a hard "pull" the danger of compression and slipping is lessened with a bi-parietal application. I believe that a pelvic application on a floating head should never be made; if you cannot get a cephalic application, do version. Assuming good application, now use axis-traction rods and also Walcher's position on the table, both of these (axis-traction and Walcher's) have been described in previous part of paper and should be read again firmly to fix principles in mind. Traction is downward until well into pelvis, when Walcher's is discontinued and line of traction changed to conform with direction for median and low forceps. If head is impacted in brim or partly through brim, if in good position, *i.e.*, O-L-A, O-D-A, or antero-posterior, apply forceps for that position; if transverse or a posterior occiput, try to do a manual rotation or force backward, with gentle manipulation to break up impaction and make floating head of previously engaged head. If neither of above can be done, do a Scanzoni; if transverse, apply as described for transverse position.

*Face or Brow.* In an extended head presenting face or brow, chin takes place of occiput and all rules are followed as for occiput delivery, remembering this point. If possible, before applying forceps, try to flex head to occiput presentation or try version and in case brow presents try to make it a face.

In cephalic application, blades should be applied parallel to occipito-frontal diameter, so that tips of blades grasp occiput and not neck of child.

*Breech.* In a rare case it is necessary to place forceps on breech: in this case, a direct application is made by guiding hand to a position over each lateral pelvic region and not one blade over sacrum and the other over pubes, and thus tip, impinging on abdominal soft parts.

### RECAPITULATION OF ESSENTIAL POINTS.

Remember axis of inlet at different plane than axis of outlet and that axis of whole pelvis describes a part of circle, with symphysis as centre. Examination of patient should be made before forceps are applied. Position of child and exact application desired

should be visualized before actual introduction of forceps.

Take time to make application and use no force in introduction of blades.

All movements and manipulations must be gentle.

All traction should be intermittent and under control of operator.

In head above brim, at a high level in pelvis or in posterior position or other position which will make difficult forceps probable, remember time spent in locating exact position and obtaining a good application of blades will save time in the end, resulting in less danger to mother and child.

When in doubt as to findings or application, stop and try again or send for assistance; do not run risks when lives are at stake.

### EPIDEMIOLOGY OF INFLUENZA.\*

By D. M. LEWIS, M.D., NEW HAVEN, CONN.

It is history that the failure to establish the cause of pandemic influenza in '89-90 because begun in '92 would not be repeated in the next future one. That such an one has been with us seems but too evident from the morbidity and mortality reports of influenza of the past two months. The opportunity afforded was early recognized by the Public Health Service, by state and municipal health authorities and with, above all, the huge services of the Army and Navy, made an array of forces available which should by now have sufficient evidence to define pandemic influenza, in turn defining the cause of epidemic and endemic influenza. Have we arrived? That we have not is shown by the reported variations of micro-organisms found in different sections of the country, with the further fact that in the same community is a different predominating organism prevailing at various short periods. Thus one week we are told there is very little question but that the influenza bacillus has all the warrants to be followed another week by a denial in that the results are in favor of a streptococcus and in turn that a variety is found such as to demonstrate that the influenza bacillus, the streptococcus, and the pneumococcus are undoubtedly secondary invaders, and a frantic search is instituted for a filterable virus.

Is there, then, any fundamental error which

prevents the solution of this timely question?

That there is may be shown by the study of the epidemiology rather than the bacteriology only, as the main factor which, as we have just shown, has not solved it. If we are asked today to define influenza we may say that it is either the clinical picture of the least symptoms or the epidemiological characteristics of outbreak and course of spread that determines its presence. All agree, none deny, that the latter view is scientific. Now, based on such, there is traced out for us that influenza was epidemic in Spain in the spring, that it spread to the neighboring countries of Italy, France, Germany, and England, in August being brought to New York City, thence to be spread west and south. The failure to find the influenza bacillus in each and every community proves to the usual mind, not that we do not have epidemic influenza, but that, as in the previous pandemic, the cause has not been found. The point I wish to make is this. Has anyone questioned these accepted facts of a pandemic coming every 20-30 years only—of arising always in the East to travel from community to community,—that the cause must necessarily be one organism which, starting with some unknown access of virulence in the original place of onset, travels true to form and only quits when burned out from lack of susceptible material or from eventual reduction of the original gain of virulence? Such cannot explain the immediate appearance of the disease in epidemic form in this pandemic of the disease in the mountain regions of Peru at the same time that it is epidemic in Spain, to the total exclusion of all other communities of South America—epidemic to the extent that, as with us, it affects practically the entire personnel of the mines and smelting mills of that mountain region, compelling cessation of business. It explains the lesser incidence among those over age 40, but it does not explain a similar lesser incidence under age 20, as being due to an immunity from the pandemic of twenty-nine years ago. Why should not the age of immunity be brought down to 29 rather than 40? It does not explain the historically repeated incidence of a United States troopship having practically the entire outfit come down with influenza in mid-Pacific early in the spring, with deaths limited to the native Filipinos aboard, while an epidemic in the Philippines has just ended at the time the vessel mentioned

\* Address to the County Public Health Officers, Nov. 7, 1918.



reaches port filled with these soldiers from the Middle West of this country.

From the viewpoint of these unexplained facts that I have just mentioned, let us consider what was going on in this country, in this state and this community in the early part of 1918. In the late spring I showed that in this year, when there was to be a drive during the summer for saving lives under age 5, that this and neighboring cities of this state had, due to pneumonia and whooping cough with a high respiratory infection, an increased death rate for children under age 5; that the same was true for New York City.<sup>1</sup> Statistics also showed that there was an excess of deaths for pneumonias in adults over 40 over the previous year. It was important for it was at an unusual period,—middle March and April. New York's *Weekly Bulletin* shows that deaths from influenza from an immediately previous weekly rate of from 10-20 went to 40-50, and that while the two excessive death ages were as we have mentioned, it was worthy of attention that the deaths from influenza at ages 15-25 were twice those from 5-15; also remember that at this same period, in various army camps, there was an unusual frequency of deaths from pneumonia, some labelled epidemics as well as what were called epidemics of mild influenza. Statistics now show the same to have been true of apparently isolated communities of every country on the continent as well as England. Further, let me call your attention to the fact that where studied bacteriologically these mild epidemics of late 1917, of 1918, were the same as the same communities presented in the pandemic of later 1918: the varying predominance here of influenza bacilli, there of pneumococci or the streptococci. Note that Rosenow finds in civil life in one community a pleomorphic streptococcus which he previously found in poliomyelitis in 1916, while an adjoining war post shows a hemolytic streptococcus. Again that this pleomorphic streptococcus has been the apparent factor in communities in England and Germany in the epidemics of 1917 and the spring of 1918, as well as in the following encephalitis epidemics in these countries. If now we study the statistics of the pathological findings of the respiratory organs of the last pandemic, the present pandemic and the immediate preceding epidemics of pneumonia following measles, we find the same lesions. One more inquiry helping to bind the

argument I wish to present to you. Why, whether there presents an epidemic of diphtheria, measles, meningitis, grip, or the present pandemic of influenza, is it that the first cases, the first deaths, are not only on the same street but frequently in the same house, even sometimes in the same family where the last epidemic of one of the other diseases a year or two previous started? It is the localization in our community of our first known case which shows us that the special seed from Spain has finally reached us although the occupants are our tenement poor, are not travelers, nor do they have immediately previously, visitors from further "East." Unremarked in an adjoining town are the deaths from typhoid pneumonia in young adults ill but two and three days several weeks in advance of the time set that influenza is epidemic and pandemic; unremarked the fact that these are from "C" street where, last year, there were meningitis and diphtheria.

Never before have we had better facilities for studying respiratory diseases than in over-night new cities—our training camps. We have, or should have learned now from statistics that following any frequency of respiratory infections like tonsillitis and bronchitis, there follows measles, meningitis, scarlet fever, and pneumonia. We have statistics now that show that with meningitis a large part of the first crop may have but tonsillitis cultures showing the infection. The frequency of pneumococcus throats is obscured, as I told you last spring,<sup>2</sup> because the throat culture is negative for diphtheria. There is now wide appreciation of streptococcal sore throats. In those where we have literature we find that the bacteriological content of an army camp of 1917 and 1918 with regard to epidemics and milder infections is duplicated in their pandemic epidemic as well as the fact that there is a lesser dominance of a pneumococcus or a streptococcus not originally there, but brought in by the last incoming draft or transferred body of men. We have, then, the curves of respiratory frequency rising and falling, carrying with them certain diseases, and following there may be other diseases. When we put in these curves the bacteriological content of the influenza bacilli, the pneumococci and the various streptococci there is definitely explained to the epidemiologist their height and their pureness of culture or otherwise, when the past infection of that camp is known. Likewise may be explained secondary waves and the why of

their height or their difference of bacterial content.

Let us go back yet further in time. In 1916 there was epidemic generally over this country the most severe wave of grip since '89-90. Its bacteriology had the same content, its introduction, as I showed in an article following the epidemic,<sup>3</sup> was in the same terms as this pandemic. We were due for the same two- or three-year interval epidemic of grip this year,—its start was later in the year than that of 1916, beginning in March-April. That it was greater in morbidity and mortality should be reasonably explained by the tremendous shifts of population. An added population of one-tenth our previous population should be the same factor as I have shown happens in the army camps. The immensity of the pandemic, as contrasted with the previous one, should be in exact proportion to the increased density of population compared to the control of these various organisms during the interim. The sum total of organisms and the variation found in localities of the various organisms may be measured by the existing content in each community; we come back to each community as having its own "starters." Not a new germ, not a special type of some old friend acquiring mystic properties in the "East," once every generation or so encircling the globe in from one to three years and then disappearing, but our known influenza bacillus, the pneumococci, the streptococci, endemic the world over for centuries apparently, as also epidemic, can explain epidemiologically and bacteriologically, pandemic influenza, if the term influenza is not restricted to those cases or, as all of us have seen, epidemics due to the influenza bacillus. In support of these facts you have the knowledge of a lesser incidence and a lower mortality in this city as compared to our neighboring cities, a measure of the lesson of 1916, the possibilities of the future of that year have been realized in results. Laboratory investigations only rather than field investigations, corroborated by laboratory bacteriology, is the reason why again, as in 1892, the epidemiology of influenza is not determined.

PEPPER, E.

<sup>1</sup> Infant Mortality: Theory and Results. BOSTON MEDICAL AND SURGICAL JOURNAL, Oct. 17, 1918.

<sup>2</sup> Prevention in Public Health. BOSTON MEDICAL AND SURGICAL JOURNAL, April 25, 1918.

<sup>3</sup> Lessons from the Past and Possibilities from the Future. New York Medical Journal, May 19, 1917.

## Book Reviews.

*Surgery in War.* By ALFRED J. HULL, F.R.C.S. Lieutenant-Colonel, Royal Army Medical Corps; Surgeon, British Expeditionary Force, France; Late Lecturer on Surgical Pathology, Royal Army Medical College, Millbank; and Surgeon, Queen Alexandra Military Hospital; with a Preface by LIEUT.-GEN. T. H. J. C. GOODWIN, C.B., C.M.G., D.S.O., Director-General, Army Medical Service. Second Edition; with 210 Illustrations. Philadelphia: P. Blakiston's Son & Co. 1919.

The object of this book has been to give members of the profession who have not practised war surgery an account of the treatment which has proved efficacious in our hands.

This second edition contains 600 pages. Seven well-known English surgeons are contributors. Many American surgeons are quoted, so that the viewpoint is not entirely British. All the old chapters are rewritten and several new ones are added.

The book is cordially recommended to the profession.

*Neurological Clinics.* Edited by Joseph Collins, M.D. New York: Paul B. Hoeber. 1918.

This volume consists of a series of clinical exercises selected from a large number presented for discussion by the staff of the Neurological Institute. There are forty-one lessons in all, covering a wide range of functional and organic nervous and mental disturbances. The cases are charmingly presented and make interesting and profitable reading. The diagnostic points and varying symptoms are minutely and carefully described in each individual case. It is interesting to note that this volume is free from so many of the traditional conceptions of nervous diseases and pigeon-holing of symptoms which is a fault of so many text-books of medicine. For completeness of discussion and clearness of clinical presentation, Dr. Collins' chapter on myasthenia gravis deserves special mention.

*Neuro-Psychiatry and the War.* A Bibliography with Abstracts. New York: National Committee for Mental Hygiene. 1918.

This volume prepared by Mabel Webster Brown, the librarian of the National Committee for Mental Hygiene and edited by Dr. Frankwood E. Williams, is a very useful and complete compendium on the rapidly growing literature on the war neuroses and psychoses. The abstracts are minute and extensive, and as such, the volume is very useful to the neurologist and psychiatrist.

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## EFFORTS AT SHOE REFORM.

THERE has been more or less discussion recently about the absurdity of women's shoes of the prevailing fashion, and efforts are being made to introduce and popularize shoes of more hygienic style than are being worn in the majority of cases at present. A well-balanced foot is necessary in the maintenance of a healthy, well-balanced body: high-heeled and narrow-toed shoes cannot properly balance the body, and cramp the muscles and joints of the foot so that they cannot be exercised as they should be in moving and carrying the body. Not only does the so-called fashionable shoe cause local pain, deformity, and discomfort,—it also is responsible for a great proportion of the back strain, eye strain, and nervous irritability from which many women suffer.

A number of specific efforts at introducing sane and sensible footwear have been made both in Europe and in this country. In France, for instance, it is reported that the Paris Acad-

emy of Medicine has issued an appeal to the people to put an end to the fashion of "French" and "Louis Quinze" heels. In America the problem is being taken up with the Y. W. C. A. This organization has a national membership of four hundred thousand to listen to the suggestions of the national board. Two main questions are to be considered: whether the manufacturers can make the shoe desired, and whether sufficient pressure can be brought upon American women to induce them to adopt it. The first matter has been discussed at a conference of manufacturers at the national board Y. W. C. A. headquarters in New York. Once the shoe is ready, the Y. W. C. A. intends to arrange for its wide distribution, so that there will no longer be heard the complaint that the right sort of shoe is not available. The feet of the American nation are one of its weakest points, as the recent draft rejections have shown. Any effort to reform and standardize shoes both for women and for men should receive the encouragement and support which it well deserves.

## "TYPHOID MARY."

THERE has been written by Major George A. Soper and published in the *Military Surgeon* a story of unusual interest about "Typhoid Mary," an individual who illustrates a new phase of the carrier problem and the distribution of communicable diseases. Mary's discovery and ultimate confinement are due to the indefatigable efforts of Dr. Soper in tracing her wandering, destructive career.

In 1906 Dr. Soper was called to Oyster Bay to investigate an outbreak of typhoid fever, which attacked six out of eleven persons in one household, all within seven or eight days. The house was situated among spacious grounds; the food and supply drainage were examined and eliminated as factors. Upon questioning the inmates of the household, it was learned that a new cook had been employed about three weeks before the appearance of the first case of illness. The former cook, Mary, was eventually located, and although she had herself never been ill with typhoid, the reports given by the eight families in which she had worked for the previous ten years showed that typhoid fever had appeared in seven of them.

In 1901, a landlady was taken ill in the

house where Mary worked. In 1902, eight out of ten of a family at Dark Harbor were ill with the disease. Four out of seven servants were attacked in a family at Sands Point, New York, in 1904. Other instances of the disease followed Mary wherever she went, until finally the New York City Health Department detained her as a person dangerous to the community.

In 1910, Mary was released on condition that she should not go again into the food producing business. For a time, she was true to her promise, but after a while she broke her parole and disappeared for five years. During that time it was later discovered that outbreaks had occurred in two different families. The investigation of an outbreak of twenty-five cases of typhoid at the Sloane Hospital for Women in New York disclosed the fact that Mary had been employed there as a cook for three months. She disappeared at the first sign of the disease, but was finally found and removed to the Riverside Hospital of the New York Department of Health, where she has been held in detention ever since. Mary's history illustrates a new problem to be considered in the distribution of communicable diseases.

### THE SIGNIFICANCE OF CANCER STATISTICS.

DURING the period of the war, active research work on cancer has been hindered by the shortage of mice, which the Government has needed in great numbers for identifying the different types of organisms in pneumonia and in making tests for poisonous gases. One aspect of the problem, however, has been studied by Dr. Francis Carter Wood, Director of the George Crocker Special Research Fund of Columbia University, who has criticized the present system of recording deaths from cancer and has pointed out the advantages to be gained by reporting the disease by age groups rather than for the population as a whole. To illustrate the discrepancies in the system now followed, he has commented upon figures relating to England and Wales and to this country.

Dr. Wood believes that the fact that the cancer death rate in England and Wales has shown such an enormous increase recently may be attributed to the circumstance that the greater part of the male population below the

age of forty-five had been removed to France and Belgium, thus leaving a predominance of old-age groups at home. Statistics including both old and young, show that for the three years preceding the war, the death rate among men was ninety-one per one hundred thousand; in 1916, it was ninety-six per one hundred thousand. During the same period before the war, the rate among women was ninety-nine per one hundred thousand, and in 1916 it had risen to one hundred and one per one hundred thousand.

It is the opinion of Dr. Wood that we may expect a similar phenomenon in this country during the next year or two. He suggests that in order to obtain a more accurate statistical survey of cancer, the cancer death rate should be considered by age groups rather than for the population as a whole. In illustration of this, he states that the death rates from cancer in the New England States have been distorted for a number of years and have given a false impression of the incidence of the disease. In 1914 the death rate in the United States was 79.4 per one hundred thousand. Vermont reported the highest mortality rate, 109.9, compared with 51.5 per one hundred thousand in Montana. Dr. Wood has pointed out that this difference in the rates may be attributed primarily to the fact that the population of Montana is made up to a large extent of the young pioneer type, whereas in Vermont the inhabitants are on the whole distinctly older. When the crude mortality of Vermont from 1908 to 1912, 102.2 per one hundred thousand, is corrected on the basis that the proportion of the population of the ages of forty-five and over is twenty-seven per cent. for Vermont, whereas it is 12.2 per cent. for Montana, the revised death rate for Vermont falls to seventy per one hundred thousand, a rate lower than the corrected death rate for the States of Massachusetts, Rhode Island, New York, Minnesota, California, and Connecticut. The corrected death rate for Montana, on the other hand, rises to 53.7.

It is interesting to observe that cancer statistics show the highest rate in the most civilized countries such as Switzerland, Holland, and Scotland, and the lowest in Russia, Hungary, and Bohemia. Dr. Wood believes that again statistics are undoubtedly deceiving, as it is probable that the difference is due to more careful diagnosis of cancer in more civilized countries.

## AMERICAN RED CROSS TUBERCULOSIS COMMISSIONS.

THE achievement of the American Red Cross Commissions in checking tuberculosis in Italy and France gives evidence of the spirit of friendly criticism and coöperation by which it was made possible. The work of investigation in Italy was carried on in three main fields,—school hygiene, child labor, and housing. The assistance offered by the Italian School Hygiene Association in allowing visiting and close inspection of existing conditions and in giving the American Commission full access to the rules and regulations already in force greatly aided the Red Cross workers in making a thorough and an intelligent study of the situation. It is plain that Italy needs to introduce and enforce some means of teaching her people even the most elementary rules of hygiene; suggestions for improving the present system have been made by the American Commission and have met with the approval of the Italian health authorities. The report of the Commission states that already measures have been adopted for emphasizing the prevention rather than the cure of tuberculosis: legislation has been formulated which aims to protect infant welfare, maintain during school life a regard for hygienic conditions, and direct the employment of young boys and girls so that they may not be forced to accept work which will be detrimental to their future health.

In France, also, a Commission investigated the local conditions, and, by the aid of grants of money, organized a chain of health centers for the provision of special treatment. Here, too, the importance of training school children to observe the fundamental principles was emphasized, and carried out by the coöperation of children, parents, and teachers. Lists were made of hygienic rules to be followed, such as personal cleanliness, plenty of fresh air at night, and daily exercise,—a series of tasks in which the children manifested a real pride in performing faithfully. Perhaps one of the most far-reaching results of the work of the Commission in France was the establishment of a system whereby local practitioners are to carry out the work which has been outlined in some parts of the country by their American colleagues.

That the criticism and suggestions offered by the American Commissions to health authorities

in Italy and France have been received gratefully by these countries and have been made in some instances the basis of future reform, indicates the value of international coöperation in matters pertaining to the investigation and prevention of disease. It is to be hoped that the efforts of the American Red Cross Tuberculosis Commissions may prove to be only the promise of success in carrying out even more extensive activities which we may anticipate for the future.

## MEDICAL NOTES.

**BABY FEEDING EXPERIMENT.**—The Baby Hygiene Association of Boston is planning to conduct an experiment with milk as the principal ingredient of diet of six infants who have been carefully selected for observation. The experiment will be carried out at the Roxbury Crossing station of the Association, and will be continued during three months. The babies will be carefully weighed, measured, and given medical supervision, and a careful analysis of improvements will be made to determine the value of the milk.

During the past year, more than 3,800 children under six years of age were weighed and measured by a large corps of physicians and nurses. The children were placed under the observation of the Baby Hygiene Association, and after a study of one year, 500 were found to be below normal; of these, 281 were selected for care at the Roxbury station. Considerable improvement has been made by weekly conferences and home visits, advice on feeding, proper clothing, and the observance of general hygienic rules.

There are several nationalities represented in the six children chosen for extended observation. Each baby will be given a quart of pure milk each day as a part of a well-balanced diet. There will be examinations every day, and frequent weighings. Home conditions will be observed during the three months in order that the experiment may be given a fair trial.

**CONFERENCE ON MENTAL HYGIENE.**—A conference on mental hygiene was held under the auspices of the Massachusetts Society for Mental Hygiene in Pittsfield, Massachusetts, on September 29. The purpose of this Society is to educate the community in the principles of mental health, foster the mental health of normal children, protect the adolescent from men-

tal and nervous breakdown, give intelligent treatment to the feeble-minded, and promote the study of mental disease and defect in their various forms and in their social and economic relations. It endeavors also to improve the standards of care for those suffering from or in danger of developing mental disorder, and to disseminate knowledge concerning their causes, treatment, and prevention.

The following papers were read at the conference, and will be published in a later issue of the JOURNAL:

"The Meaning of Mental Hygiene," by Frankwood E. Williams, M.D.; "Mental Hygiene and Childhood," by William H. Burnham, Ph.D.; "The Relation of the State Hospital to the Community," by John A. Houston, M.D.; and "Some Special Problems of Mental Hygiene with Special Reference to the Work of this Society," by A. W. Stearns, M.D.

**AWARD OF DISTINGUISHED SERVICE MEDAL TO DR. JOEL E. GOLDTHWAIT.**—Dr. Joel E. Goldthwait was awarded the Congressional Distinguished Service Medal on September 10 by Major-General Clarence R. Edwards, for exceptionally meritorious and distinguished service while serving with the American forces in France. The citation read: "The award is made for special work in organizing the development section in France." Dr. Goldthwait had charge of the development battalion of the 26th division and of the thousands of men who were sent to the reconstruction and development camp. In his capacity as orthopedic surgeon he trained the men suffering from flat feet and other minor causes which rendered them unfit for service at the front. Three villages in France were given over to Dr. Goldthwait, and in five weeks, forty per cent. of the men under his care and treatment were restored to health and service. A few weeks later more men were returned to their companies until seventy per cent. of the men who had been classed as non-combatable were returned to the trenches. Dr. Goldthwait's achievement well deserves this tribute to his service.

Colonel J. R. Kean, of the Medical Corps of the United States Army, in summarizing the various phases of Army service in which Colonel Goldthwait attained distinction, has mentioned the three following ways in which his

initiative proved to be of especial value: (1) in simplifying and standardizing splints so that only a few types were necessary and they could be supplied in greater abundance and more easily used; (2) in applying graduated exercises and correct positions for remedying physical disabilities; (3) in suggesting the establishment of reconstruction hospitals where maimed soldiers, instead of being discharged for their disabilities, could have them corrected as far as medical science could accomplish that result.

#### BOSTON AND MASSACHUSETTS.

**WEEK'S DEATH RATE IN BOSTON.**—During the week ending October 11, 1919, the number of deaths reported was 171 against 1285 last year, with a rate of 11.20 against 85.43 last year. There were 33 deaths under one year of age against 101 last year.

The number of cases of principal reportable diseases were: Diphtheria, 54; scarlet fever, 26; measles, 55; whooping cough, 17; typhoid fever, 6; tuberculosis, 40.

Included in the above were the following cases of non-residents: Diphtheria, 10; scarlet fever, 9; tuberculosis, 5.

Total deaths from these diseases were: Diphtheria, 3; scarlet fever, 1; whooping cough, 1; tuberculosis, 10.

Included in the above were the following non-residents: Diphtheria, 1; tuberculosis, 1.

Influenza cases, 11; influenza deaths, 2. Last year: Influenza cases, 1,520; influenza deaths, 850.

**TUBERCULOSIS CAMP AT SALEM.**—At the end of September, the Salem Association for the Prevention of Tuberculosis ended the fourteenth season of its camp activities at Salem Willows. The work of this organization was begun by the Salem Associated Charities and the society became incorporated in 1914. At the present time, Josiah H. Gifford is president of the Association and Miss Rosamond Lynch is dispensary nurse. During the summer there was an average number of forty patients a day. Plenty of fresh air was made possible by means of sleeping tents and open air pavilions. The camp is maintained chiefly from the funds collected each year by the sale of carnation pinks. The noonday lunches which are served to the patients and the disinfectants

have been furnished by the Salem Board of Health hospital.

During the winter, this Association conducts a dispensary and patients are visited in their homes by the nurse. During the influenza epidemic the Society was especially active, and still is caring for patients who developed tuberculosis as a result of the disease.

**HYDE PARK DENTAL CLINIC.**—The Hyde Park Dental Clinic, which has been in operation for the past two months under the direction of Dr. George Farrell, is proving to be of great service to the community. It is open for the care of persons of all ages on Wednesday and Saturday for the benefit of families whose income is under a certain amount. Up to the present time, there have been admitted one hundred and fifty-four patients, a great many of whom are school children. This is the only clinic of its kind in the community, and the fact that there is a waiting list of one hundred shows that it is appreciated.

**BROOKS CUBICLE HOSPITAL.**—The Brooks Cubicle Hospital which is being erected on Corey Hill for the treatment of pneumonia patients was opened September 29. The hospital consists of a main building with two wings, between which there is an open court. Each room is open on three sides to sunlight and fresh air, and twenty patients can be cared for at one time. The total cost of the building will be about \$150,000, of which \$130,000 has been contributed. Dr. Thomas Durell of Somerville is to be chief of the staff of physicians, and Miss Elizabeth Pelton the superintendent of nurses.

The efficacy of the treatment which will be followed in the Brooks Cubicle Hospital has already been proved by Dr. Brooks, who had constructed similar buildings in South Boston last year. They were later taken down and moved to Cambridge, then to Somerville, where they have been re-erected on the grounds of the Somerville Hospital and are in active use at the present time. The superiority of an open-air hospital in the treatment of pneumonia was demonstrated on Corey Hill during the influenza epidemic. When the regular hospitals of Boston and the emergency hospitals were overcrowded, a camp hospital was improvised on Corey Hill. Of the patients cared for, only twelve per cent. died, and this death rate was reduced to one and one-half per cent. later;

this is quite a contrast to the death rate of fifty per cent. to sixty per cent. in the hospitals of other districts. Because of the apparent advantages of the open-air treatment, nine of the principal towns of Massachusetts established similar hospitals under the direction of units from Corey Hill. Other units carried the treatment farther away, one reaching the State of Idaho.

#### NEW ENGLAND NOTES.

**CASTINE GENERAL HOSPITAL.**—The Castine General Hospital, at Castine, Maine, was founded by Dr. Harrison Briggs Webster of Boston. Dr. Webster graduated from Harvard Medical School in 1909. He accompanied Dr. Grenfel on his mission in Labrador and Newfoundland and became greatly interested in that type of medical practice. On his return to New England, he visited the sick in the little island hamlets on the coast of Maine where the inhabitants could secure no medical advice and assistance. He finally settled in Castine, where he bought a large house and began to build up a hospital for the benefit of the hundreds of people who would otherwise have been neglected in their remote homes. Dr. Webster left this work to enter the service, in which he gave his life. In 1918, with the rank of major, he sailed overseas as director of ambulances and later was made regimental surgeon of the 47th infantry. While conducting an expedition to the first line trenches to bring back the wounded, he was killed by a bursting shell.

But the noble work which was begun in the little town of Castine is still being carried on in the spirit of its founder. The hospital has been incorporated and will be known as the Castine General Hospital. It will be supported by an appropriation from the state, by two appropriations and private funds, and by its own income.

**MAINE STATE CONFERENCE OF CHARITIES AND CORRECTIONS.**—At the annual meeting of the Maine State Conference of Charities and Corrections held in Portland on September 25, Dr. Eugene Kelley, Commissioner of the Massachusetts Board of Health, discussed the institution of sex instruction in public schools. Dr. Kelley is reported to have opposed this mass instruction, maintaining that the home should be the place in which to provide sex education, either through the parent, the pastor, or the family physician.

In speaking of the films which are frequently presented, Dr. Kelley advocated the exhibition of such pictures by the Government in the army camps and among the men in the naval service, but expressed the belief that it was dangerous to display them in theatres to young people. Dr. Kelley emphasized the community's responsibility for venereal diseases, but urged conservatism in viewing the problem, stating that statistics are sometimes greatly exaggerated.

## Correspondence.

### PORTABLE X-RAY APPARATUS.

Mr. Editor:—

As an individual having had a considerable contact with portable x-ray apparatus for eighteen years past and as a member of the first joint-committee appointed by the Surgeon-General for the devisal of standard x-ray equipment for army use, may I be allowed briefly to comment upon certain points dealt with in the article of Dr. W. K. Coffin, which appeared in the JOURNAL of October 2? As it so happens, the primal point therein constitutes the gist of the article and is presented, in summary, by the statement that the "Army bedside x-ray unit" forms, with certain modifications, the basis for a much-to-be-desired portable apparatus.

While I am freely in accord with the general opinion that the Army bedside unit furnishes, at present, a most effective method for bringing to the bed-fast patient a relatively potent source of x-rays, *where a sufficient current supply is available*, I assert, nevertheless, that, since this apparatus is useless without such sufficient supply, it is not a portable unit in the proper sense of the term.

By stating, moreover, that the Army bedside unit differs from "other portable apparatus" in that it entails the use of a transformer instead of a high-frequency coil, the author of the article conveys to the reader his assumption that all other portable apparatus is constructed so as to produce an induced discharge of high frequency. Such an assumption is erroneous. No roentgenologist of experience, I believe, today regards the Tesla discharge seriously as a source of x-rays. Its fluoroscopic effect is usually brilliant, but its radiographic efficiency is extremely low.

Veritable portable units, furnishing their own current through the mediumship of accumulators, have been used for years with most excellent results in all cases wherein the accessory appliances mentioned by Dr. Coffin, in enumerating the limitations of the bedside unit, are not necessary. An extremely efficient type was designed and described by Caldwell in 1902; another type has been used by me since the middle of the last decade and by at least one of my Boston colleagues, with reasonably uniform success, and at no undue expense to the patient. The only unusual outlay has been for travel and time. Experience and skill should form the basis upon which to ask recompense for such expenditure.

Since, thus, it is not self-contained, the bedside unit has not been regarded by the X-ray Division of the Surgeon-General's Office as of use where true portability is required. Otherwise, there would have been no necessity of designing the Army portable unit, one of the three standardized equipments for the medical service, which furnishes its own current up to any required amount.

Unit devices for the generation and application of x-rays, to be truly portable, must embrace equally

portable sources of electrical energy, in order that the operator may be thoroughly independent of a current supply which may or may not exist amid the surroundings of the patient. Thus equipped, he is able to pursue his investigations under any possible condition; whether aboard ship, on moving railroad trains, or in the depths of the backwoods. The occasional necessity for working in a "kerosene lamp district" is only too well known to the average operating surgeon, and he will agree with me, I am sure, that therein are found cases which often have desperate need of medical aid on the spot.

Respectfully yours,  
PERCY BROWN, M.D.

### RECURRENCE OF INFLUENZA EPIDEMIC.

New York, Oct. 11, 1919.

Mr. Editor:—

In your editorial of October 9, 1919, you indicate the general care as to prevention and treatment in the event that influenza shall soon again attack us. I regret very much that you do not mention one remedy which is not a specific but which will act more favorably and efficiently than any other, both as a preventative and curative drug in influenza. It is salicylate of ammonium, given promptly and in sufficient doses. To my mind, there is no question as to its utility and advantages. This I have dwelt upon and explained previously, but, unfortunately, those whose authority rules in matters of health have not tested the salicylate of ammonium as I have advised its use, and hence it has not had the wide endorsement which its value deserves. Perhaps this timely letter may become effective in making my colleagues everywhere do as I most earnestly wish. In addition to the use of salicylate of ammonium internally, I would emphasize most strongly the value of the perforated zinc inhaler when properly and sufficiently worn and medicated, which is at once more curative and more protective than any other inhaler of which I have any knowledge.

BEVERLEY ROBINSON, M.D.

### SOCIETY NOTICES.

**SUFFOLK DISTRICT MEDICAL SOCIETY.**—A stated meeting of the Society will be held at the Boston Medical Library, 8 The Fenway, on Wednesday, October 29, at 8.15 P.M.

1. Business: Election of Nominating and Auditing Committees.

2. There will be three fifteen-minute papers:

"Types of Diseased Conditions Most Frequently Seen in the Teeth, and Their Diagnosis." Leroy M. S. Miner, M.D., D.M.D.

"Teeth from an Orthopedic Point of View," Robert W. Lovett, M.D.

"The Relation of the Teeth to the General Health," Charles H. Lawrence, Jr., M.D.

There will be a general discussion following the papers.

Guests will be welcome at the second part of the meeting, which will begin at 8.45 P.M.

JOHN BAPTIST BLAKE, M.D., *President*,  
GEORGE GILBERT SMITH, M.D., *Secretary*.

**NORFOLK SOUTH DISTRICT MEDICAL SOCIETY.**—Stated meeting, United States Hotel, Boston, Thursday, November 6, 1919, 11.30 A.M. Reader, Major F. B. Granger, M.D., (Surgeon-General's Office, Washington, D. C.). Subject: Physical Reconstruction in Military and Civil Hospitals (illustrated by photographs), for Dr. F. C. Granger, Randolph.

Censors will meet at 2 P.M. to examine candidates for Fellowship. Candidates should make application to the Secretary at least a week before examination.  
DR. C. A. SULLIVAN, *Secretary*, South Braintree.



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## Original Articles.

### NEUROLOGICAL SURGERY AND THE WAR.\*

BY HARVEY CUSHING, M.D., BOSTON.

I HAVE been prevailed upon to address you briefly under the title of "What Neurological Surgery Has Gained from the War." This is a common type of question and one which is difficult satisfactorily to answer in this period of readjustment from the confusion and demoralization of the past few years. Neurological surgery has undoubtedly profited something and will profit still more, for many neuro-surgical conditions still remain to be treated; but at this immediate juncture the losses are more evident than the gains; productive investigations have been interrupted, and the most eminent contributor to this branch of surgery lies under the sands of Mesopotamia—a victim of the far-reaching conflict.

In this early post-bellum period one may speak only in broad generalities of the profit side of the column. Our main object appears to have been accomplished,—the defeat and ultimate destruction of Prussian militaristic ag-

gression,—and we hope for an era of better international understanding and relations. To this end we have been ready to sacrifice all, and at this uncertain moment of peace treaties little else matters. We have had to cut back the tree to get out the disease, and just what form it will assume when new sprouts are put forth only time can tell; but unquestionably, all of us, on whatever branch we formerly perched, will be more or less affected.

It would be much more befitting at this time, it seems to me, to inquire what neurological surgery has contributed to the war than what it has gained from it; for neuro-surgeons, so called, like other surgeons, enlisted with the intention of giving service rather than with any expectation of receiving surgical training or experience.

In the lay mind the idea is harbored that the war has been a veritable mecca of experiences, particularly for the young surgeon. He may have gained confidence, it is true, and may have learned much regarding fractures and wound contamination that is applicable to the traumatic surgery of civil life, but those who know realize that a military hospital in time of war is far from an ideal surgical training ground for those who must subsequently adapt their experiences with battle wounds in healthy young

\* Read before the Annual Meeting of the Massachusetts Medical Society, June 4, 1919.

adults to the treatment of pathological conditions in the diseased and infirm. When operative work comes to military surgeons—if they are so situated that it comes at all—it occurs, for the most part, in spasms, when inadequate clinical notes are made—sometimes none at all; when there is scant time and few facilities for “cleaning up”; when a succession of wounded who may not even have been taken from their stretchers are borne in, operated upon, taken away and never seen again. I am visualizing scenes in forward hospitals, but it is in such areas that the bulk of the major surgery of war must be done, and under these conditions even a surgeon with long established habits begins to lose his operative fastidiousness, and makes the usual excuse—it’s the best one can do: *C’est la guerre*.

It of course is not always as bad as this, and some military hospitals, like Depage’s Ambulance in La Panne, more favorably situated, may retain their selected personnel and continue to do as careful work in recording, studying, and operating upon their patients as in a civil hospital; some officers, indeed, may even make notable contributions to our knowledge—meanwhile. But except in special hospitals set apart for special work, where officers may be freed from all military obligations, an investigative spirit is seldom fanned into flame.

The conjunction of ability and opportunity, rare enough at all times, is still more so in time of war; for when these two factors essential to the advance of knowledge happen to be thrown together, so many administrative difficulties are interposed and interruptions are so frequent as to render effort fruitless. That Carrel and Dakin, in a special hospital at Compiegne, under a Rockefeller Institute grant, were able to work out a new technique for the treatment of septic wounds; that Strong and his co-workers, under the auspices of the Red Cross Research Committee, could solve the relation of the louse to trench fever show that co-operative investigations even in the zone of the armies were possible and might prove to be most profitable; but these essentially productive studies are notable exceptions to the general rule. The significance of these two pieces of work lies not only in the immediate applicability of the results on a large scale to check the wastage of wounded and sick, but in the fact that in each instance the investigators were

freed for the time being from other military duties and thus, undisturbed, were privileged to receive and work intensively upon material carefully selected for the single purpose of solving a specific problem. I, by no means, wish to imply that these were the only creditable studies done in the hospitals overseas; far from it; but merely that they are outstanding examples of what may be accomplished by bringing ability and opportunity together and fostering them even within the distracting sounds of battle.

Many physicians may gain experience in a given subject but not many are capable of contributing to it, and then only when clinical material and facilities are brought to hand. This is true of medicine and surgery in general, and even more so of such a special branch as the surgery of the nervous system. During the course of the war efforts were made, particularly in some of the British armies, to forward the knowledge of wound treatment for certain major types of injuries by sorting and routing them to specified hospitals in the army zone. The privilege was thus afforded to a selected few to broaden their experience, and in many cases definite contributions were made to the technical management of these more serious conditions—notably penetrating wounds of the chest, abdomen, skull, and knee joint, and fractures of the femur,—with the result of a general lowering of the mortality from wounds of these critical types.

It was in one of these hospitals to which all head cases were routed that I had my most interesting and satisfactory period of service while overseas, and incomparable opportunities were afforded to study the symptomatology, controlled by operation or autopsy, of acute cerebral lesions in every imaginable part of the brain. But there was no observer sufficiently trained to take full advantage of the situation whose services could be spared from the immediate and urgent surgical tasks before us, nor was it possible to retain cases for a sufficient length of time to investigate fully their neurological results. Hence, aside from some possible improvements in the operative handling of cranio-cerebral injuries, the utilization of the material for the acquirement of information regarding cerebral function which could be of general future value was impossible.

This sort of study was necessarily relegated to base areas and home hospitals. There, ad-

vantage was doubtless taken of the opportunity by many, and unquestionably the next few years will see the publication of observations of great value. Among some of the notable contributions which have already appeared may be mentioned the important studies of acute cerebellar lesions and of occipital lobe injuries by Gordon Holmes, and the illuminating series of papers by Henry Head and his co-workers on the mass reflex, automatic bladder, and other phenomena which accompany spinal cord transections.

I have always regretted that the British, in view of their unquestioned leadership in neurology, did not set aside early in the war some special hospital or hospitals where at least the bulk of the organic neurological cases could be congregated and where the neurological and surgical problems relating to lesions of the brain, spinal cord, and peripheral nerves could be worked over on a large scale by the concentrated efforts of their abler men. Such an arrangement would have been best for the victims of the injuries, and far more likely to furnish new information, useful not only now but for all time. Had something comparable to Mitchell, Moorehouse, and Keen's wards at Turner's Lane in the Civil War, though on a far larger scale, been started early it would have served as an example for our own medical corps to follow. However, a soldier with a serious injury to the nervous system is finished from a military standpoint and it is perhaps more than human to expect that an army, especially when fighting overseas, will make elaborate provision for his care.

The French, it is true, had a Centre Neurologique for each army, where were congregated both the functional and organic neurological cases, and the Salpêtrière in Paris served as a great depository for neurological material of all types in the established clinics of Déjerine and Pierre Marie. Perhaps the most immediately useful contributions from the standpoint of neurological surgery which have thus far emerged during the war were the two monographs by Tinel from Déjerine's clinic and by Madame Benisty from that of Pierre Marie on the subject of peripheral nerve injuries.

In our own army—well, the "cow jumped over the moon." What might have been accomplished in the way of organization had the war only lasted another year was the common talk of many tongues after the armistice. Let us

be thankful that we were not given an opportunity to demonstrate our perfections. After all, a scant six months of actual combat with an almost invisible army which suddenly swells to two million will seriously strain any organization, and the corps whose unfortunate task it is to care for the casualties, which are merely an innumerable to the army, is in the natural order of things the corps whose desires and needs are attended to last of all.

So far as neurological surgery was concerned, the main features of our program were as follows: To place as an urgent measure one or more surgical teams under an operator with some degree of neurological experience in each mobile or evacuation hospital in order to cover so far as possible the early treatment of the cranio-cerebral injuries; to arrange in the large hospital centres of the intermediate zone for a group of surgeons and neurologists to care for the cases arriving at the area which were to be congregated in one hospital so far as conditions permitted; to establish further in the rear, on the French system, two or three centres, each under a neurological director, where still more elaborate arrangements for the study and surgical care of these special cases with proper laboratory facilities could be had. Under this plan, which had the advantage over the British and French systems of more or less unified control of the wounded in their progress from the forward hospitals to the base, not only could supervision be had of the case throughout, but the situation at the main centre would be most favorable for studies contributory to our knowledge.

By the eleventh of November this program was so far under way that neuro-surgical teams were not only established in the more important and active evacuation hospitals but a special forward hospital for head cases had been in operation during the latter part of the Argonne offensive. The second part of the plan had been very imperfectly developed through lack of trained officers, though in some of the more important hospital groups it was in operation. A start, moreover, had been made to establish a real neurological centre under the charge of Lient.-Colonel McCarthy at Vichy, after the arrival in France of Base Hospital 115.

It was our earnest hope that this institution might be transported intact to this country and might serve as a centre where neurologists, psy-

chiatrists, neuro-surgeons, and the orthopedists with experience and interest in problems relating to the peripheral nerve injuries might collaborate, and which might represent the nucleus of a permanent National Institute of Neurology. Could this have been accomplished—and I believe that something of the sort may still be possible—neurology would have gained something from the war which would prove to be of enduring benefit not only to neurology, but to general medicine.

### JAMES EWING MEARS, M.D., LL.D.

(A PERSONAL RECOLLECTION.)

A PROMINENT surgeon "of the old school"—if such a term may now be used of the early Listerian era—has recently passed away. Dr. Mears, who at the time of his death in May last was in his eighty-first year, was born in Indianapolis and educated at Trinity College, Hartford. He entered the Jefferson Medical School in the autumn of 1863. Coming as he did to Philadelphia with favorable credentials to the great exponent of surgery, Professor S. D. Gross, he began what was destined to be his life-long career in that city. It was on such an occasion that the present writer and Dr. Mears first met, enjoying an introduction from our mutual patron, and thus an acquaintance, begun under such favorable auspices, ripened into an enduring friendship.

The highwater mark of the Civil War had been reached when the battle of Gettysburg had been fought, a few months before this date, and although the course of medical study of those days was a pathetically short one, a medical student of the "class" of that year had but little opportunity to do his share of war work before the return of peace. Philadelphia was, however, not far from the actual seat of hostilities, and many hospitals in and around the city gave opportunity for surgical training which was of great educational importance to the future surgeon. "Old Man Gross," as the students of those days were wont affectionately to call him, had in full measure the ability to inspire his students with enthusiasm, and those whom he selected as marks for special notice were fortunate indeed in the favorable conditions under which they began to practice their profession.

It is not therefore surprising that the young

student selected surgery as his special calling and became a recognized member of the group more intimately associated with the great master, among whom may be mentioned Maury and the younger Gross, both men of great promise.

While a student in Philadelphia, during the winter of 1863-4, the present writer had an opportunity of seeing much of the society of his fellow student, occupying with him a suite of rooms in a well-known hostelry on Broad street. Mears at that time, although but a few years the older of the two, seemed much more mature. He had come from St. Louis, where he had been living at the outbreak of the war, and gave the impression of a man of the Southern type of physique, albeit he had done loyal Union work in that city at the commencement of hostilities. The full beard and abundant growth of hair, which fashion permitted in those days, fitted in well with a serious demeanor to give the young man an air of maturity beyond his years. Thus, though a certain element of reserve existed between chums, brought together from far distant sections of the country, a common enthusiasm for a chosen calling brought the two young men into a sympathetic understanding of one another and so it came about that this brief association of one college term brought with it a life-long intimacy.

The all-absorbing activities of the immediately following years did not leave time or opportunity for much mutual intercourse, but summer vacations gave Dr. Mears an opportunity to visit New England and to get an insight into some of its medical institutions. This was a period when Harvard was taking a leading part in the new departure of medical education and Mears was thus enabled to acquire a familiarity with two of the prominent seats of medical learning in this country and thus keep actively in touch with the spirit of the times.

Dr. Mears' professional life in Philadelphia can better be described by his colleagues of that city; suffice it to say here that he rose steadily in his profession and became associated with the work of many of the leading surgeons of the day, until finally he took his own place as a surgeon and a teacher of note.

His work on the mouth and jaws should be mentioned as among his most notable surgical achievements, and also a book on Practical Sur-

gery, published in 1878 and 1885. As a teacher he gained much renown as a drill master for aspirants for the naval medical service and doubtless many a naval, and probably, also, army, surgeon, who has done duty in the great war, has reason to be thankful for the rigorous ordeal to which he was obliged to submit to enable him to pass his examinations. It was said that Mears never had a pupil of his fail to pass, consequently he was much sought after, and the number of those who profited by the instruction and discipline which he exacted must have been sufficiently large to exert a perceptible influence upon the morale of the service.

Dr. Mears was a charter member of the American Surgical Association and had much to do with its organization and early policies; and the culminating event of his surgical career may be said to have been reached when, in later years (1893), he was elected president of the Association.

Dr. Mears never married and so when his time for retirement from practice came he was free to wander about and to enjoy all the rights and privileges of an American tourist of professional standing. Curiously enough, he began this phase of his career by becoming a student once more and taking part in one of Harvard's summer courses. An article entitled "From the Rostrum to the Benches" pleasingly portrays this experience.

It would be difficult to follow Dr. Mears in all of his subsequent travels, which covered many parts of the world, including South America and India. There stood out, however, one characteristic feature which manifested itself on all occasions,—an ability to identify himself with the interests of any locality that he happened to visit. Many newspaper accounts received by the present writer enabled one to follow his course of travel and to obtain valuable information of the scientific activities of the regions visited. It was the quality of making friends with all classes in foreign lands which enabled the traveler to gain much profit as well as pleasure from his wanderings. In later years it was Mears' custom to spend a portion of each summer in or near Boston and, needless to say, it was during this period that his professional acquaintance in that city was greatly enlarged. He was an honored guest on many an occasion, whether it be an inauguration of a college president or one of the numerous gatherings of medical alumni.

He took great interest in younger men and inasmuch as fate had ordained that he should be childless, he conceived the idea of acquiring an "academic son," and thus it came about that he established a scholarship in Trinity College, Hartford.

The plan to have a "medical son" in the Harvard Medical School was put in operation many years ago and it was his wish to have the recipient enjoy the benefit of the gift from the time of entrance until final graduation. The academic father was thus able to interest himself in the fortunes of deserving students through a critical period of their careers. But he did not find the task a simple one and many were the complaints that the good doctor's friends were expected to listen to in regard to the shortcomings of his protégé. But the numerous problems with which he had to contend on his annual visit to Harvard seemed to take the place of the responsibilities which had been laid aside on his retirement from practice. It proved an admirable means of keeping an old man in close touch with the progress of science and the changing currents of medical education and student life.

Mears wielded a facile pen and few of the annual gatherings of the American Surgical Association were allowed to pass by without some contribution, at times reminiscent in character, on other occasions dealing with some quite up-to-date problem. For several years he had taken great interest in the new study of eugenics and had prepared, from time to time, papers on the various phases of this subject. These he embodied in a publication entitled "Problems in Race Betterment," and published by him in 1910.

As early as 1894 Dr. Mears had advocated the ligature of the spermatic cord as a substitute operation for castration in the treatment of hypertrophy of the prostate gland; a few years later he was led to suggest this operation in the treatment of defectives in order to produce a state of asexualization. Since then he has also advocated an analogous operation in the female, consisting of ligature of the fallopian tube. He prefers this form of operation to the actual removal of the organs, for, as he says, "that the testis and ovary produce an internal secretion which is necessary to the normal functioning of the body tissues has been demonstrated." Ligature of the cord he prefers to vasectomy as to controlling to some extent the activity of

the testis without actually destroying its function as an organ of nutrition. Surgical procedures instituted for the prevention of procreation in suitable cases, he claims, "should not be regarded as a method of punishment but as a remedial measure, the sole object of which are the betterment of the human race through the arrest of the continual flowing stream of degeneracy and the mental, moral, and physical improvement of defective subjects."

Enough has been said to show that Dr. Mears was keenly interested to the last in medical science and medical progress, and that he was evidently anxious to do his bit as a public-spirited member of our profession is plainly shown by many generous gifts to medicine. Among several bequests to Philadelphia medical institutions may be mentioned one for the foundation of a scholarship at the Jefferson Medical School, his Alma Mater. In addition to the scholarships already referred to at Harvard, a gift of \$10,000 to the Harvard Cancer Commission may be mentioned. Harvard College becomes also the residuary legatee to found "Courses of Instruction in Eugenics" and the wish is expressed that the subject shall be taught in all of its branches, notably that branch relating to the treatment of the defective and criminal classes by surgical procedure. Believing this to be a subject "which concerns most importantly the welfare of the human race," he plans to leave a generous endowment for the object in view.

It is evident that Dr. Mears hoped that the time was not remote when the examples of the states of Indiana, California, and Connecticut should be followed by many sister states. Few still fail to agree with our friend on the importance of the new science of eugenics and all will doubtless welcome a gift for research, in the light of constantly increasing knowledge of physiological processes and social problems, from new points of view which inevitably will present themselves from time to time.

It is pleasant to feel that the profession of medicine has still the power to inspire its devotees with altruistic schemes as a mark of its vigor and constantly increasing importance in bringing about the well-being of mankind.

J. C. W.

#### REFERENCES.

"The Problem of Race Betterment," 1910, p. 42.

## A FEW INDUSTRIAL MEDICAL PROBLEMS AND TENDENCIES.

BY HERMAN W. MARSHALL, M.D., BOSTON.

MEDICAL treatments of industrial accident compensation cases, as is well known, are beset with difficulties not encountered in care of private patients suffering with similar injuries; and there exists still considerable misunderstanding among the medical profession as well as dissatisfaction frequently in dealings with insurance companies.

Insurance men on their part are not uniformly pleased with medical services rendered by practitioners to disabled workers whose expenses their companies are expected to pay.

There are at least these two sides always in each example of this important group of cases besides a number of other phases; so that the more perfectly physicians understand business points of view or insurance men understand the needs of their doctors the better will become the situation for all concerned, including the injured persons. For these reasons reviews of the facts made in as fair minded judicial manner as possible are desirable at intervals to throw additional light on medical phases, attitudes of patients, business aspects, and certain legal features.

Private practice of medicine is based on a comparatively simple relationship between two individuals involving confidence of the patient in each instance; and on the other hand, involving the skill, judgment in fixing medical fees, honesty, friendly interest and personality of the physician: the most important factors in successful private practice presumably being the honest friendly interest and personality of the doctor.

Industrial practice is based on these same elements besides others, but different values are set necessarily on them because of the commercial nature of industrial practice. Confidence of any group of careful business men depends still on a physician's honesty, interest, and personality, but his skill and fees are scrutinized and compared with the skill and fees of many other physicians with far greater care than is done by the average private patient.

The medical profession has to reconcile itself to these facts if there is to be a continuance of industrial medicine or extensions as proposed into health insurance for the masses of people. Progress along these lines means a gradual partial loss of the present independence of medi-

cal practitioners to an unknown extent; and although some specialists and family physicians may continue as they have been doing in the past, yet they are liable to have not quite as many patients who come to them under old conditions, nor the range and freedom which would be possible without industrial medical developments.

Some medical men may have to abandon private practice as their sole means of livelihood and enter the industrial field to some extent, whether they desire to or not; but it is fair to recognize, however, that there may be new benefits for doctors, although these are unappreciated at the present time, which may be evolved from changes now going on.

It is conceivable that the influence of insurance methods managed on broad lines may be salutary in the long run to reputable medical practice, as well as to the public, through forming a natural check to undesirable tendencies toward the charging of excessive fees for services of not especially great value; and in keeping up the standards of all practitioners to higher levels of efficiency.

On the other hand, it is likewise conceivable that business methods, unless properly regulated with precision, may be abused easily by unscrupulous individuals or companies, so that the medical profession may be compelled to make more efficiently organized opposition to harmful tendencies.

The question can be asked properly now whether or not insurance companies are the robbers which some physicians and patients would have us believe. It is fairly certain that large sums of money are not being made generally by them as is shown by the fact that a very considerable number of companies have dropped their industrial accident compensation branches on account of losses incurred instead of earnings gained; and so the position of any fair-minded insurance adjuster is worthy of careful consideration by the medical profession.

He is trying to give good service to those insured in his company and to the injured men; also he is obliged to keep medical fees and other expenses down within certain limits. His aim along medical lines is to get maximum medical service for a minimum price.

Some companies favor extremely low doctors' fees and are willing to shift rapidly from physician to physician, accepting lowest bidders, thus making such medical work unprofitable

and unsatisfactory from the point of view of all concerned.

Other companies encourage reasonable fees and are loyal to their doctors, and there is a growing belief in some quarters that most service for the least price can be gained in the long run through careful selection and adherence to physicians of sound judgment and honesty, to those who are not ready to cut the rates of fellow practitioners and who also have interests of the insurance company equally well in mind.

The circumstance that highest priced specialists are not desired by insurance men can be explained by the fact that results obtained have not been commensurate with the prices paid.

The present tendency, therefore, of best industrial practice seems to be toward trimming off highest and lowest fees.

An insurance adjuster is confronted with the difficulty that some patients and some doctors attempt to deal unfairly with insurance companies. Legal advisers occasionally suggest ways to injured workmen whereby they can get excessive amounts of compensation, and doctors have been observed to pad their bills with as many visits as they can make and collect payments on. Adjusters make mistakes also, and it has to be admitted there are possibilities for very complicated situations very often.

In view of these existing difficulties it seems to some persons that extensions into health insurance can be deferred profitably and entered into cautiously in Massachusetts later after greater familiarity and success have been attained in handling difficulties of industrial medical experiments already going on.

The medical practitioner's standpoint in industrial practice, especially in the group of protracted disabilities with which the writer has had some experience as an orthopedic surgeon, may be either very satisfactory or discouragingly unsatisfactory.

Numerous injured workers who are anxious to return to their occupations as soon as possible, and many with large families dependent on them without money to pay for courses of medical supervision or for apparatus, will co-operate fully with the attending physician. The latter can get better results usually in long continued cases than is possible at large clinics at hospitals where less time necessarily can be spent on each individual, and where shifting of hospital doctors or division of responsibility

among groups of physicians whose ideas perhaps do not harmonize closely tend to lessen degrees of success attained.

It becomes a pleasure to a physician to send these many useful members of the community back to industry again quickly and to save unnecessary expense for all. Medical work of this kind, in the writer's opinion, can be made of great value to medical practice in general if it helps to balance extreme medical fads and inefficiencies which tend to evolve at times from independent private practice.

An exasperating feature which is encountered rather commonly, however, arises from lack of coöperation of the injured in their treatments. Perhaps they agree at the outset to do their part, but at the end, after the doctor has given them very careful attention, some decide then to get as much money from the insurance company as they can, regardless of the justice of their claims. In such instances physicians' efforts and insurance companies' money are largely wasted; and it becomes obvious that industrial practice requires more than medical skill for most successful results. Each industrial case ought to be subjected to thorough preliminary investigation to determine the status of the patient and his future intentions and the likelihood of fulfillment of his part of the program.

An argument advanced by most injured individuals when they are questioned is interesting and convincing at first, namely, that they would prefer to be back at their usual occupations rather than drawing compensation: because the latter payments are not as great as wages they received previously.

Nevertheless, very often it is not true that they are anxious to return to industry promptly. At times, in addition to accident compensation payments some men receive disability benefits from fraternal lodges and other sources which make a disabled condition more lucrative for a limited time for them than active labor. Others are injured at the close of the season for work in their special occupations, when a period of loafing naturally would be ahead of them. These injured persons frequently try to tide over the time until the next period of activity in their particular lines by attempting to remain incapacitated during the whole interval irrespective of the injuries received.

Some try to combine a vacation with an alleged disability; and there is a very considerable number who are naturally lazy and who are contented to stay inactive as long as they receive money enough barely to exist. When members of this last mentioned class receive definite injuries, like fractures of the arms or legs, surprisingly long periods are alleged by them to be necessary for recovery; and it is only by following such cases closely, and repeatedly discrediting the numerous excuses that are continually raised, that finally they are forced back to work.

The poorer the wages received the more inducement there is to loaf, and particularly is this so because feeble ambition is quite commonly associated with meagre pay. An injury to some such men besides disabling them physically annihilates their inclination to struggle on against new temporarily harder conditions, and there seems to be no way of avoiding some abuses in this direction.

The consideration of exact degrees of benefit which are to be derived from any proposed medical treatment is a matter of importance from a business standpoint. Some improvements in patients' conditions without return to wage-earning capacities are negligible from an insurance company's viewpoint; whereas in private practice very slight grades of betterment are gratefully paid for by patients occasionally in extremely liberal manner.

Difficulties frequently arise naturally between the various companies and general practitioners on this score: and whether complete responsibility can be assumed profitably and safely or not by insurance companies for treatments of the injured from the dates of the accidents to their return to industry is still an unsettled question.

In the present stage of progress in Massachusetts there frequently arise situations in which doctors have treated industrial cases long and faithfully according to the best of their ability, and then have met with objections when their bills have been rendered. These bills perhaps have been trimmed down in advance to pass the expected scrutiny of an insurance adjuster; and yet even then further reductions are demanded. The amounts involved may be small and this haggling at such times is very distasteful to most medical men.

In fairness, however, it has to be remembered that industrial cases are transacted in



business ways; and that compromises even in trivial affairs are the rule more commonly perhaps in legal adjustments than payments of full amounts for which claims are made. Insurance adjusters are simply following usual customs of settling claims moderately satisfactorily to both parties involved, and these minor bills in the aggregate must be kept down to definite limits by the company. It is as much the duty of physicians dealing with industrial cases to learn the usual practices of adjusters and govern themselves accordingly, as it is for adjusters to familiarize themselves with peculiarities of medical practice.

The most satisfactory way of dealing harmoniously with insurance agents is for attending physicians to ascertain in advance the views of the particular company concerning the patient before attempting treatment of any sort.

An interesting phase of medical practice which is being brought into prominence now by industrial considerations is the matter of maximum *versus* minimum amounts of medical care. Private practitioners range themselves against industrial physicians over this problem; at least, each is dealing with extreme opposite aspects of the situation and yet both may be equally honestly striving to give satisfactory treatment to patients. Private practitioners declare, perhaps, that industrial cases are neglected, and undoubtedly this accusation is a true one occasionally; while industrial physicians are of the opinion that many patients now receive a lot of unnecessary attention when treated by family practitioners. Between these two points of view, in time it seems probable that the real truth will become clearly defined and industrial medicine presumably will be credited finally with bringing out this important negative side of medical advancement which otherwise might remain neglected.

Determinations of minimum amounts of care which will yield good results do not signify necessarily that medical activity will be minimized, for, on the contrary, medical endeavors may be directed along new and more profitable channels at increased speed possibly and with lessened waste of energy. Industrial medicine may lead to more clearly cut differentiations between the art of medical practice and scientific medical attainment; for certainly there are undeniable differences between a person becoming a very skillful practitioner or being a living encyclopedia of medical knowledge, although

these two sides are blended in variable proportions in every doctor.

Even the tremendous importance of wholesale prevention and lessening of industrial accidents by safety devices or improved working conditions cannot obscure the desirability of increasing the efficiency of the individual physician in his care of injured individuals. The maintenance of best individual balance requires new decisions continually of values for special and general medical knowledge: wise selections from broad views and narrow precise ideas, as well as numberless estimations of theoretical, practical, social, economical, and other elements which determine any individual's delicacy of poise and efficiency. And upon the efficiency of the individual unit depends the efficiency of the whole system of medical practice.

Perhaps the greatest need of all at the present time in industrial medicine is increasing honesty and impartial fairness in transactions by all concerned.

Insurance adjusters claim they are now a pretty decent set of persons and that they handle their difficulties about as fairly and as well as can be expected. Doctors, patients, legal advisers who are involved, all claim likewise their intentions of square dealing and of looking only after their own rights; yet as the acuteness and pressure of modern industrial situations increase there must be improved facilities for adjusting differences, or increasing honesty and fairness, or both improvements for best results.

The Massachusetts Industrial Accident Board, with its medical adviser, has the power to direct future progress along lines which are favorable or unfavorable, and one has simply to know of the careful impartial service which is being rendered now to feel certain there will be diminutions of the difficulties in the future which naturally surround the many complicated situations encountered.

It should be apparent to everyone also that there is great need of keeping up the highest grade of efficiency in this Board in the present troublous times; and that they should be given as free an opportunity as is possible to act for the best interests of all concerned impartially, carefully, and expeditiously in the future.

Personally the writer has found insurance adjusters ready to extend periods of payments willingly when good reasons exist, and patients and their legal advisers ready to accept his opinions so often, that it is impossible to doubt

that an exceedingly simple straightforward policy of fair dealing will suffice still to give satisfaction even under the most complicated circumstances. And as familiarity with industrial problems increases and knowledge becomes more widely spread, it will appear that safeguarding of rights will as frequently include those of insurance companies as those of patients and physicians. Progress is being made rapidly in right directions at present, but it behooves the medical profession to see to it that harmful tendencies which may unconsciously develop from lack of medical attention do not prosper.

Best development demands increasing interest of the medical profession as well as of business interests.

### EPILEPSY IN SCHOOL CHILDREN.

BY EDWARD A. TRACY, M.D., BOSTON.

THIS paper briefly reports a survey of epilepsy made in three Boston school districts, comprising 2786 pupils in grades from the kindergarten to the eighth. It is hoped that a consideration of the benefits of this survey may aid in providing for its extension, to include all of the school districts. Shanahan<sup>1</sup> has made the statement that "Conservatively speaking, every two or three per thousand of the average population are epileptic." Among the 2786 school children examined there were found nine epileptics. This gives a proportion of 3.2+ per thousand school children. Brief histories of the nine cases of epilepsy found follow:

CASE 1. May 1, 1916. H. D. Female. Aged 14 years. Had severe convulsions in infancy for a period of two weeks. Measles at 6 years. At 7 years, her mother states that at times she would suddenly clasp together her hands, and at times would become "deadly white" and faint. At 8 years convulsions occurred. Attacks increased in severity till from her tenth year she has averaged sixteen attacks of *grand mal* per month. Treatment ineffectual. Had to give up school. Cared for at home, her mother refusing institutional care.

CASE 2. Nov. 13, 1916. T. H. Female. Aged 13 years. Had measles at 2 years, pneumonia and pleurisy at 11 years. At 8 years had a fall from a tilt, striking on her head and be-

coming unconscious for three hours. At 12 years had attacks of sudden dizziness and of sudden weakness for a period; these recurred in July, 1916, and from then on she suffered from fainting spells, sometimes four in a week. The fainting spells had been attributed to heart disease. Several examinations showed the heart to be normal. Marked pallor found present. A patch of gray hair is noted on the right frontal region. Patient is chronically constipated. This case recovered under treatment which lasted a year. The subjective symptoms of dizziness and headache quickly improved, and the objective signs of irritability and fainting spells ceased after three months. No recurrence after a year and a half without treatment. She graduated from the grammar school, and has worked in a department store the past year.

CASE 3. February 14, 1917. J. O'B. Male. Aged 12 years. Pneumonia at 1 year. Measles, whooping cough and mumps at 8 years. His history gives fainting at sight of blood since eighth year. Is very nervous. Bárány's sign, conjugate deviation of the eyes, constantly present. Abnormal sympathetic reactions and chronic vasoconstriction spots were present. Under treatment the nervousness ceased, and on every occasion (five) in which chance meeting with the sight of blood has occurred, there has been no feeling of weakness nor fainting. Without medicine for a year and no recurrence.

CASE 4. October 30, 1917. A. J. Male. Aged 10 years. Had bronchitis at six months, whooping cough at 2 years, and measles at 7 years of age. Maternal aunt is an epileptic. In June, 1917, commenced to have dizzy and fainting spells. He would become "deadly white" and fall. Twice he had two attacks on the same day. He suffered so frequently from dizzy spells that his mother ceased sending him on errands for fear something might happen to him. Examination showed chronic vasoconstriction spots and abnormal sympathetic reflexes. The boy's mother was informed of the diagnosis—incipient idiopathic epilepsy. Under treatment his dizziness, pettishness, and attacks of fainting spells ceased. After six months the mother concluded there was nothing the matter with the boy and stopped medication. After a few months without medication, the dizziness and fainting attacks recurred, and again yielded

to treatment. Again the mother neglected to continue medication, and on May 25, 1919, witnessed her son's first convulsion. This has awakened in the mother a realization of her neglect to follow medical advice and it is hoped she will henceforth be more persistent in following it. Incidentally it confirmed the accuracy of the diagnosis made nineteen months before the first attack of convulsions.

CASE 5. November 15, 1917. F. Z. Male. Aged 12 years. Had measles at 5 years and diphtheria at 6 years. First attack of convulsions in May, 1917. Had six attacks of convulsions from that time to Nov. 15, 1917. The mother states that after the first attack the boy came to her at different times complaining of strange sensations. The boy took medicine faithfully for six months, and the dizzy and strange sensations and the convulsions ceased. The mother then, thinking her son cured, omitted medication. After about two months without medication, convulsions recurred. Under further treatment, quite negligently carried out the attacks are infrequent and not severe.

CASE 6. March 8, 1918. M. G. Female. Aged 10 years. Had whooping cough at 8 years. Is an orphan, living with her maternal grandmother. The grandmother states that she herself had convulsions from her sixteenth to her twenty-fourth year. Patient has chronic rhinitis. First attack of convulsions December 24, 1917. Is very nervous and irritable. Suffers from dizzy headaches and frequent fainting spells—had four in one day once, and two in one day at another time. Has characteristic vasomotor reflexes and chronic vasoconstriction spots found in epilepsy.<sup>2</sup> Under treatment there is a marked improvement in subjective symptoms and in irritability, and in the number of attacks. Because of the home environment, the grandmother was advised to send the child to Monson State Hospital. This she absolutely refused to do while the grandfather is alive.

CASE 7. February 7, 1919. A. C. Female. Aged 13 years. Had diphtheria at 8 years and was in the hospital then for four months. Seen in school after a fainting attack. Her history gives several such fainting spells. The heart is normal. Several examinations showed chronic vasoconstriction spots and epileptic vasomotor reactions. Her mother was advised of the diagnosis—incipient epilepsy. She promised to

send her daughter to the Clinic for Nervous and Epileptic Children at the Forsyth Dental Infirmary for treatment.

CASE 8. April 5, 1919. C. F. Female. Aged 11 years. Had whooping cough when a baby, and measles at 2 years. Fell out of a two-story window when between 2 and 3 years of age. The year following there came on attacks of *petit mal*. Has had four years of institutional care (at Monson). Has many "absences," lasting a moment, every day. The writer witnessed three of these attacks within a period of fifteen minutes. In them the child stared, was unconscious. On another occasion an attack was witnessed, while patient was sitting. It lasted twenty-five seconds, the patient swaying slightly while unconscious. Immediately after the attack, in answer to the question, "Are you better?" she said, "Just a little excited, that's all." Under treatment for a short time, the mother reports a marked lessening in the number of attacks.

CASE 9. April 2, 1919. M. F. Female. Aged 9 years. A sister of Case 8. She had whooping cough when a baby. Has attacks of *petit mal* like her sister's, but not so numerous. Has had four years of institutional treatment (Monson). Now attending school, in first grade, and attacks are lessened in number under treatment.

#### SUMMARY.

Amongst 2,786 school children there were found nine epileptics. Four of these were major and five were minor cases.

The work required to make this survey was not inconsiderable, but the gleanings in this field have made the effort well worth while. The large number of facts garnered, facts of observation, of neurological testings, and of medication, will furnish, in part, when collated, the basis for an article on the diagnosis and treatment of idiopathic epilepsy in its incipency.

To the Director of Medical Inspection of Boston Schools, Dr. William H. Devine, the writer desires to express his gratitude for kindly encouragement and counsel, and for his practical efforts for the betterment of epileptic school children.

#### REFERENCES.

- <sup>1</sup>Sharahan, William T. *Inter-state Medical Journal*, 1917, Vol. XLIV, p. 137.
- <sup>2</sup>See "Idiopathic Epilepsy a Sympathiconia?" in *POSTGRADUATE MEDICAL AND SURGICAL JOURNAL*, 1918, Vol. CXXVIII, Nos. 23, 24, 25, and 26; and "Chronic Vasoconstriction Spots and their Significance," in same publication, 1919, Vol. CXXX, No. 1.

## Society Reports.

### MASSACHUSETTS ASSOCIATION OF BOARDS OF HEALTH.

THE regular quarterly meeting of the Massachusetts Association of Boards of Health was held at Atlantic House, Nantasket, Mass. Dinner was served at 12.45 P.M., after which the business of the meeting was taken up. The following report of the special committee on tuberculosis was read by Dr. Curtis. The report was discussed by members and finally accepted, although no recommendations were adopted.

WHEN DOES A PERSON BECOME A CASE OF TUBERCULOSIS FROM THE POINT OF VIEW OF THE BOARD OF HEALTH AND WHEN DOES HE CEASE TO BE SUCH?

Your committee has thought it best to present certain recommendations to the Association with little or no comment, leaving it to the Association to discuss the question and decide whether to accept or reject them.

Although it is not so stated, your committee has decided that the question refers to tuberculosis of the respiratory organs alone and has based its report upon that decision.

The recommendations are based largely upon the papers read at the meeting of the Association held in July, 1918, and the discussion which followed, but your committee has also consulted such literature bearing upon the subject as it could find and asked the opinion of physicians in active practice.

There is no question as to the status of the so-called open cases in whose sputum tubercle bacilli have been demonstrated; these must be reported to the board of health at once; but there is a fair difference of opinion in regard to the so-called closed cases, which show the physical signs of tuberculosis but in whose sputum tubercle bacilli have never been demonstrated.

These cases are not a danger to the public, within meaning of the statute, as long as tubercle bacilli are not present in the sputum, but they may become dangerous at any time. If these persons do not have bacilli in the sputum, reporting them to the board of health may be a hardship to them and failure to report may,

under certain conditions, cause danger to the public.

Your committee recommends that only persons falling into the following classes be reported to the local board of health, as persons infected with tuberculosis within the meaning of the statute.

Class A. Persons having the ordinary physical signs of active tubercular disease of the respiratory organs, in whose sputum the presence of tubercle bacilli has been demonstrated.

Class B. Persons having the ordinary physical signs of active tubercular disease of the respiratory organs, in whose sputum the presence of tubercle bacilli has not been demonstrated, but whose physician believes that it would be better for them to be under the supervision of the local board of health.

All persons who show physical signs of active tubercular disease of the respiratory organs in whose sputum the presence of tubercle bacilli has not been demonstrated, whether put in Class B or not, should have periodic examinations made either by the family physician or at a dispensary. They should *not* be told that they have nothing to worry about and to go out and forget it.

Persons in Class B should have periodic examinations made, either by the family physician or at a dispensary.

Persons who have once been reported may have their names removed from the books as active cases when the family physician or the dispensary reports in writing to the board of health that they are "cured."

A "cured" patient is one who has been for at least two years without any increase of the physical signs and has shown no bacilli for the same period. Physical examinations must be made at least four times a year, either by the family physician or at a dispensary, and the bacteriological examinations at similar intervals at a laboratory approved by the local board of health.

Persons who have once been reported, may have their names removed from the books, when the board of health is convinced from its own observation of the case, that such removal will be without danger to the public or the patient himself.

Your committee believes that the above recommendations can be carried out without any change in the present laws and will solve the question of the closed case with a proper regard

to the protection of the public health and to the rights of the careful consumptive.

Signed, W. L. YOUNG, M.D.,  
FRANCIS GEO. CURTIS, M.D.,  
FRED J. RIPLEY, M.D.

The following resolutions were passed on the death of 1st Vice-President Lewis M. Palmer, M.D.:

The Massachusetts Associations of Boards of Health, through its Committee, hereby expresses profound regret in the sudden and untimely death of Dr. Lewis M. Palmer of Framingham, a long-time useful, faithful, honored, and beloved physician, officer and member of this Association. His genial personality, quiet, gracious sympathy, wise, experienced counsel, courageous attitude for right and clean living, with his great interest in the work of this Association, makes his loss most keenly felt and deeply regretted. Be it therefore

*Resolved*, That we convey to the family our sympathy, appreciation, sorrow and great sense of loss. Be it also

*Resolved*, That these resolutions be spread upon the records of this Association, and that a copy be sent to the bereaved family, and that they be published in the BOSTON MEDICAL AND SURGICAL JOURNAL.

Signed, A. S. MACKNIGHT,  
C. W. MILLIKEN,  
W. H. ALLEN,

*Committee.*

## REPORT OF THE HARVARD INFANTILE PARALYSIS COMMISSION.

BY ROBERT W. LOVETT, M.D., BOSTON.

THE Harvard Infantile Paralysis Commission was appointed in September, 1916, by the Corporation of the University and has continued in existence since that time with its personnel unchanged. The members of the Commission are Professor Milton J. Rosenau, Assistant Professor Francis W. Peabody, and the writer as Chairman, with Mr. Roger Pierce as Secretary.

It seems fitting that after three years of activity, some account of its work should be presented to the medical profession and to the public. To the former, because we have had throughout its support and coöperation, and to the latter, because its generosity in furnish-

ing financial support has enabled us to continue the work for the last two years.

The Commission was established in the first instance for three purposes:

First, to act as the agent of the Massachusetts State Department of Health in the care of children paralyzed in 1916.

Second, to aid in diagnosis and early treatment of acute cases.

Third, to study the cause and transmission of the disease.

These three divisions of its work were pursued in the first year, and publications resulted as shown in the footnote.\*

In 1917 and 1918 new cases were fortunately few. The war involved the United States and as three members of the Commission were in service, the work of the Commission was much handicapped and only the therapeutic part was continued. This was possible because that department was sufficiently well organized to go on under adverse conditions, and from the beginning of the work that part of the Commission's work has been active continuously.

Even without the war the treatment part of the enterprise would have dominated the others, because in the absence of an epidemic, the importance of treatment would naturally become the dominant of the three factors.

Clinics have been held at The Children's Hospital Out-Patient Department, Tuesday, Thursday, and Saturday mornings, to which paralyzed children have been brought for treatment. Up to October 1, 1919, there have been 423 clinics, 513 patients have been treated and a total of 7871 treatments have been given.

In addition to this the staff of the Commission's Clinic has conducted clinics at various parts of the State. Up to October 1, 1919, there have been 39 State clinics, 803 patients have been treated and a total of 1556 treatments have been given. These clinics have been held in the following cities:

Malden .....	1
Beverly .....	
Lawrence .....	
Lynn .....	
Melrose .....	
Quincy .....	
Newburyport .....	2

\* "The Harvard Infantile Paralysis Commission and Its Work in Massachusetts," by Robert W. Lovett, M.D., Boston, Mass., published in the BOSTON MEDICAL AND SURGICAL JOURNAL, January 13, 1917, and the *Harvard Graduate Magazine*.  
"A Report of the Harvard Infantile Paralysis Commission on the Diagnosis and Treatment of Acute Cases of the Disease during 1916," by Francis W. Peabody, M.D., Boston, Mass., published in the BOSTON MEDICAL AND SURGICAL JOURNAL, May 3, 1917.

Greenfield	}	.....	3
Worcester	}	.....	
Lowell		.....	4
North Adams	}	.....	5
Haverhill		.....	7
Springfield		.....	—
TOTAL		.....	39

Total number of patients treated at both the Children's Hospital and State Clinics is 1516, and the total number of treatments given is 9427, from October 1, 1916, to October 1, 1919.

Field workers have been provided for various parts of the State, to carry out treatments at the homes of patients, and nurses from the Instructive District Nursing Association of Boston have been provided to carry on the same sort of work in Boston and Greater Boston.

For the year 1918 the Harvard Infantile Paralysis Commission had four field workers. The total number of visits made to homes by these workers was 4788. The town of Brookline paid for another field worker, under supervision of the Commission. This worker in 1918 made 393 visits. Haverhill, also, paid for three workers. The average number of visits made weekly by these three workers was 32. The number of patients being visited by Commission Field Workers at present is 565 and the number of patients being visited by the District Nurses at present is 163, a total of 728 patients being visited at their homes.

Beginning October, 1918, field workers have held small treatment clinics in Springfield, Northampton, Lowell, and North Adams. In Springfield two treatment clinics have been held every month, with an average attendance of 22 out of 25 patients notified. In Northampton one treatment clinic has been held every five weeks, with an average attendance of 11 out of 15 patients notified. In Lowell one treatment clinic has been held every five weeks, with an average attendance of 25 out of 35 patients notified. In North Adams one treatment clinic has been held every five weeks, with an average attendance of seven out of 20 patients notified.

Cases of infantile paralysis throughout the State, with the exception of Fall River, New Bedford, Leominster, Fitchburg, Chicopee, Holyoke, and Pittsfield, are being cared for by the Harvard Infantile Paralysis Commission. Cases are not handled by the Commission in the above named cities because there are opportunities offered in these cities for after-treatment for poliomyelitis. Occasionally pa-

tients come to the Harvard Infantile Paralysis Commission for treatment from the other New England States, New York, Pennsylvania, Southern States, and Canada.

The following is a copy of reports sent to the Harvard Infantile Paralysis Commission by the Instructive District Nursing Association of Boston:

From the time of the epidemic in 1916 until December 1, 1917, the following work has been done in and about Boston by the District Nursing Association:

- 140 patients have received treatments from the nurses.
- 1352 treatments have been done by the nurses since the beginning of the work.
- 55 average treatments per month have been given at the branch station clinics.
- 200 average treatments per month have been given in the homes of the patients.

From June 1, 1917, to February, 1919, the following report is submitted by the District Nursing Association:

- 177 infantile paralysis patients were given massage and muscle training by our nurses in connection with treatment given at The Children's Hospital.
- 36 children were entirely unable to walk—the others had a good deal of paralysis: some of legs; others, arms; and others, face or abdomen. Of the 36 who were unable to walk, 33 are now able to do so.
- Of the 177 children as a whole:
  - 53 are now practically cured.
  - 95 are very much improved.

The Harvard Infantile Paralysis Commission pays a salary of \$900 for one worker in the Infantile Paralysis Clinic in the Massachusetts General Hospital. All Commission adult patients seen at State Clinics and all children over twelve years of age are transferred to the Massachusetts General Hospital. When a Massachusetts General Hospital infantile paralysis patient lives in the middle or western part of the State, on request of the surgeon in charge, a Harvard Infantile Paralysis Commission field worker is sent to visit the home to supervise after-treatment.

The following is a copy of a report sent from the Massachusetts General Hospital to the Harvard Infantile Paralysis Commission:

Of the 41 cases transferred or referred from the Harvard Infantile Paralysis Commission to the Massachusetts General Hospital, 35 have reported. The other six are being followed by Social Service.

- Under treatment ..... 35 cases
- Intensive treatment ..... 20 cases
- Observation and direction ..... 15 cases
- Operation advised ..... 19 in 17 patients
- Operations performed ..... 17 in 15 patients
- Braces and apparatus ..... 17 patients

The results from operations have been satisfactory in all the cases, with the exception of two, in whom a further operation will be necessary to correct the deformity.

The response to the exercise treatment has been so promising that the importance of carrying it out in the older and post-operative cases is definitely recognized.

Much of the success of the work of the Commission, and the fact that the clinics,—both hospital and State,—are still so large, is due to the splendid coöperation from the Children's Hospital, the Massachusetts General Hospital, the Massachusetts Society for the Prevention of Cruelty to Children, the State and Local Boards of Health, the Community Nurses, School Nurses, and District Nurse Associations. In temporary and permanent placing of children, the New England Home for Little Wanderers, the Children's Mission, the New England Peabody Home, and Wellesley Home for Convalescent Children, of the Children's Hospital have always generously given their assistance. The Industrial School for Crippled and Deformed Children has solved the school question for a very large number of paralyzed children in or about Boston. The Avon Home of Cambridge has furnished transportation and given financial aid for all patients in their district.

Private individuals deserve mention for their generosity in furnishing, often, Commission patients with motor and attendant services.

Mrs. John Hayes Hammond, for two years, supplied funds to pay expenses of running an ambulance, thereby enabling a large number of patients to come for treatment regularly, who otherwise would have been able to come only occasionally.

Especial mention should be made of the willing coöperation the Commission has received from the American Red Cross throughout the State. Ambulance service, motor service, attendant service and financial aid, whenever requested, have been given generously.

The money for conducting this enterprise has been raised wholly by public subscription, except that in the first year (1917) the State Department of Health contributed \$5,000 and in 1918 the Permanent Charities Fund contributed \$3,000. A simple statement of the work and an appeal for funds has been issued annually and sufficient funds have been forthcoming to support the work.

The total amount received from the beginning until October, 1919, is as follows:

Received from appeal sent out early in 1917 .....	\$15,198.92
Received from appeal sent out in 1918 (1st appeal) .....	7,373.68
Received from appeal sent out in 1918 (2nd appeal) .....	12,226.40
Received from appeal sent out in 1919 (1st appeal) .....	6,436.50
Received from the cities of Haverhill, Lowell, North Adams, and Springfield for State Clinic expenses and from miscellaneous sources .....	775.67
<b>TOTAL AMOUNT</b> .....	<b>\$42,011.17</b>

The Commission expenditure, per year, is approximately \$15,000 and is distributed as follows:

#### ANNUAL EXPENDITURES.

Surgeon in attendance at all clinics .....	\$1,000.00
Executive Secretary .....	2,000.00
Director of Physical Therapeutics .....	800.00
Seven workers .....	7,800.00
One, clinic worker only, .....	350.00
Stenographer .....	900.00
Motor service .....	600.00
Massachusetts General Hospital .....	900.00
Clerical work .....	120.00
Running expenses:	
Laundry .....	
Carfare .....	
Telephone .....	
Printing (charts, stationery, etc.) .....	
Office supplies .....	
Clinic supplies .....	
Parcel post .....	
Stamps .....	
Library Bureau .....	
Approximate total .....	900.00
<b>TOTAL EXPENDITURES</b> .....	<b>\$15,370.00</b>

#### JANUARY 1, 1918, TO JANUARY 1, 1919.

Bills paid by Commission to Apparatus Shop for braces for patients amounted to .....	\$2,312.40
The amount received from patients, in payment for apparatus, amounted to .....	2,080.46
<b>BALANCE UNPAID</b> .....	<b>\$ 231.94</b>

When the Commission started, apparatus was paid for from Commission funds. This was found to be inadvisable as patients abused the apparatus, neglected to wear it, and various parts were lost. Beginning April, 1917, patients were required, as far as possible, to meet the apparatus expense, which has resulted in their taking much better care of it. The above items show how well the latter arrangement has worked out.

The Commission has no overhead expense for rent, clinic facilities being generously contributed by the Children's Hospital. The members of the Commission receive no salary, and

the money contributed by the public is *directly* expended on the care of paralyzed children.

The most important practical question that arises is whether after three years there is enough to be accomplished in such cases to warrant this somewhat elaborate organization and this very considerable expense. The answer is as follows:

First, the following table, prepared in advance of definite scientific data, to be presented later, is part of the answer.

- A. Of 126 patients paralyzed at the time of, or since, the 1916 epidemic, under treatment less than six months:
  - 32.5% were practical or complete recoveries
  - 13% remained stationary or grew worse
  - 54% were improved or greatly improved
- B. Of 178 patients paralyzed at the time of, or since, the 1916 epidemic, under treatment from six months to one year:
  - 20% were practical or complete recoveries
  - 16% remained stationary or grew worse
  - 70% were improved or greatly improved
- C. Of 74 patients paralyzed previous to 1916, under treatment less than six months.
  - 17% were practical or complete recoveries
  - 31% remained stationary or grew worse
  - 51% were improved or greatly improved
- D. Of 57 patients paralyzed previous to 1916 under treatment from six months to one year
  - 12% were practical or complete recoveries
  - 30% remained stationary or grew worse
  - 58% were improved or greatly improved

Second: This part of the answer is that the parents are willing to continue to bring their children to the clinics, which proves they are satisfied with the progress of the patient.

Number of treatments given at The Children's Hospital Clinic, according to years, is as follows:

November and December, 1916 .....	418
January through December, 1917 .....	3,835
January through December, 1918 .....	3,453
January through September, 1919 .....	2,758

Number of treatments given at the State Clinics, according to years, is as follows:

	NO. OF CLINICS	TOTAL ATTENDANCE	AVERAGE ATTENDANCE
Jan. through Dec., 1917	27	1023	38
Jan. through Dec., 1918	8	291	36
Jan. through Sept., 1919	4	167	42

Third: The good reputation of the clinic is shown by the fact that many patients, paralyzed previous to 1916, have been brought for treatment.

Fourth: Cases which require operation are becoming many in number because operative measures are not, as a rule, advisable until late in the history of the disease. By having

control of the attendance of patients we are able to see that operation is performed when required.

#### OCTOBER 1, 1916, TO DECEMBER 31, 1918.

Total number of cases that have reached the point of operation .....	162
Cases operated on previous to admission to clinics .....	12
Cases admitted to hospital for operation .....	103
Operations performed in 1917 .....	33
Operations performed in 1918 .....	54
Operations deemed inadvisable after admission to hospital .....	16
Operations advised, patient waiting for admission to hospital .....	71
Operations advised but permission not yet granted by parents .....	23

On these four points it would seem proper to say that the usefulness of a treatment clinic at the end of three years was well established.

From the total number of patients treated, 1516, the following deduction of cases, at present inactive, should be made:

#### INACTIVE CASES

##### OCTOBER 1, 1916, TO OCTOBER 1, 1919.

Total number of inactive cases .....	697
Practically normal .....	126
Facial paralysis (not regularly treated) .....	15
Having other treatment .....	272
Private doctor .....	77
Mass. Gen. Hospital .....	34
Transferred to other clinics .....	145
Sent to institutions .....	16
Canton Home .....	6
Convent .....	1
House of the Good Samaritan .....	1
New England Pea-body Home .....	8
No cooperation in the homes of patients .....	216
Moved away .....	68

Scientific data as to the result of treatment have been assembled and arranged but not yet analyzed for publication, because of war conditions. They relate to the following points:

1. Figures and charts showing general results of one year's treatment upon cases paralyzed at the time of, or since, the 1916 epidemic, as compared with cases of longer duration.

2. Analysis, by individual muscle groups, showing per cent. of each which gained, lost, or remained stationary, at the end of six months' and of twelve months' treatment.

3. Figures showing the amount of power present in individual muscle groups, at the first examination and after twelve months' treatment.



4. Comparison—as shown by the spring balance muscle test—of the result of treatment on patients whose general muscle power averaged below 25% of normal at the first examination, and on patients who averaged above 25% of normal on the first examination.

5. Comparison—as shown by the spring balance muscle test—of the per cent. of improvement after twelve months' treatment on patients whose general muscle power averaged below 25% of normal on first examination, and on patients whose general muscle power averaged above 25% of normal on first examination.

The enterprise possesses a certain educational value. The clinics have been visited by doctors from various parts of the country and certain cities and states have adopted the plan in a modified form.

Competent trained women to treat these cases effectively are very hard to find and this clinic has furnished, from its staff, several women to work in other parts of the country. It is hoped to develop this matter of training further for women in the future.

The Commission has considered carefully the figures and facts as presented here and is of the opinion that the enterprise, as it now exists, is performing a useful and desirable function. It is preventing disability in many children and enabling others to improve more than they would otherwise and assisting some to recover completely. To abandon the work at this time would be to deprive 884 paralyzed children of the services of a group of trained workers, which would be disrupted if the work of the Commission stopped, and this group could not be replaced in a long time.

This would be unfortunate, not only in the present situation, but should another epidemic occur, here or elsewhere, such a group of organized trained workers would be most desirable, either to use here or to be used to recruit enterprises of a similar sort in other states. That such epidemics are not unlikely is indicated by the fact that Sweden again has, this past summer, suffered a severe epidemic. In the history of the disease the two great epidemics in Sweden, in 1905 and 1911-12, have been followed within two or three years by extensive epidemics in the United States; the connection between which has never been accounted for.

The Commission is, therefore, desirous of continuing this work for the present, if the public is willing to support it. All the facts and figures at its disposal have been freely stated and it remains for the public to decide whether it cares to continue its former generous support. The funds at present on hand will carry the work on until about January of the coming year and to be effective it must be continued on the present scale, which is as economical and careful as the Commission has been able to make it.

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### Book Review.

#### *Plastic Surgery of the Face, Head, and Neck.*

By JOSEPH C. BECK, M.D., F.A.C.S., and IRA FRANK, M.D., F.A.C.S., St. Louis: C. B. Mosby Company. 1919.

Plastic surgery has become increasingly important from the beginning of the war to the present time. The demands which will be made upon surgeons in restoring the mutilated faces of returning soldiers and sailors will be great, and they should be prepared as fully as possible to meet the responsibility which it will be necessary for them to assume. In order to bring before the profession the importance of this work, the authors of "Plastic Surgery of the Face, Head, and Neck" have published this material describing the most important operations about the head and neck which can be performed by men who have had sufficient surgical training. A set of ninety stereoscopic illustrations and seventeen charts, showing the technic of operations, with complete descriptions, have been prepared under the personal supervision of the authors. A manual describing various branches of plastic surgery gives a historical résumé of plastic surgery, and contains articles in palatoplasty, operations for cleft palate; cheiloplasty, operations for deformities of the lips and cheeks; and blepharoplasty, plastic operation on the eyelid. The process of substituting artificial for destroyed organic structure and a new method of using silver wire in bone surgery are explained. The manual contains thirty-three illustrated case reports covering every known phase of plastic surgery. This work sets forth the achievement of plastic surgery up to the present time and promises to be of great value in promoting its further advancement.

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## INDUSTRIAL TRAINING AND UNREST.

ANY possible solution to the industrial problems with which the nation is confronted at the present time should be carefully considered. In this connection, the War Department has issued recently a circular letter, by the authority of Colonel Arthur Woods, assistant to the Secretary of War, urging the twenty thousand factory owners and industrial corporations in the country to provide industrial training for workers, with the payment of a living wage during the period of apprenticeship. It has been estimated that the majority of the thousands of American workers who are earnestly trying to do their best are really attaining not over thirty-five per cent. of their possible capacity. This is a situation for which some remedy must be found.

In considering what it means to have six million workers doing what four and one-half million could accomplish if they were properly

trained, it must be remembered that not only does it involve payment of wages for one million and one-half unnecessary workers, but it greatly lowers the total output beyond what could be achieved with skilled and intelligent man power. These factors aggravate the high cost of living. With greater production, lower prices would inevitably result; and it has been proved by a number of factory owners that individual productions can be doubled by even a very short period of training. The question of returned soldiers only emphasizes the need of this industrial training. Many of them, entering the service unskilled, have come back with a broader vision, with ambition to increase their earning power and improve their condition. For these men industrial training should be offered immediately: the men, in return, will prove to factory owners that it has been a paying investment.

At the outbreak of the war, when there was a great need for increased productivity, the United States Training Service under the Department of Labor organized industrial training classes which not only produced a greater number of men, but increased the efficiency of the old unskilled workers throughout industrial plants. The nation's level of ability was raised throughout the country: should the twenty thousand industrial corporations in the United States, now that Congress is no longer to make appropriation for continuing this national effort, allow the level of production to remain stationary, both for their own sakes and for the sake of the workers?

This is a problem to be well considered. High wages alone will never settle the unrest which is sweeping over the country. Our ten million factory workers must be given an opportunity to escape from their monotonous, changeless task, to comprehend something beyond mere daily routine, and to express their own personal ambitions in working out of unskilled labor to more skilled and interesting work. The industrial leaders will find that the men will more than pay for their training in increased output and the development of leaders who can intelligently direct the workers. Not only will it result in increased efficiency instead of increased expenditure, but it will also bring contentment among the men by the knowledge that they have a chance to increase their earning power and so gain independence and higher education. Colonel Woods has offered this suggestion as the

fundamental approach toward solving the high cost of living and minimizing industrial unrest. Corporations and employers who desire further information are urged to communicate with his New York office at 360 Madison Avenue.

### THE CANEY CREEK COMMUNITY CENTRE.

AN interesting project for bringing about the sanitary regeneration of a Southern district is illustrated in the organization of The Caney Creek Community Centre in the mountainous district of the "poor whites" in Knott County, Kentucky. Here there are gathered together about two hundred and fifty families and fourteen hundred individuals within a territory of about forty square miles. Originally of good Celtic stock, these people have lived in isolation so long that they are at present far behind the modern standards of hygienic living.

In order to improve the conditions in which these mountaineers are now living, efforts are being made to better the homes and sanitation of the community. A farm has been purchased, a community club formed, a clubhouse erected, and a comprehensive inheritance-health survey has been begun. A district nurse has been employed to direct the care of babies at birth, disinfect houses, give instruction about methods of distributing diseases, adopt measures toward the isolation of infectious diseases, and secure the coöperation of families in the treatment of trachoma and other eye troubles. A hospital and rest home is being constructed for the prevention and treatment of disease, and a clubhouse affords opportunities to visiting physicians to give educational talks. Plans are also being made whereby lantern lectures may be given to the people at schoolhouses and other places of public gathering. It is expected that these lectures and the activity of the district nurse will make it possible to secure the coöperation of the community in improving the general sanitation of the district.

That the North is interested in this project is evidenced by the financial and personal aid which has been given to The Caney Creek Community. A Wellesley woman is to be the director of the Wellesley Recreation Hall, for which funds have already been pledged in

part. Radcliffe Cottage is the home and center of administrative activities. The Rest Home and hospital, to be about forty feet square and with three available floors, is under construction, although funds are still needed for its completion. Other buildings will be devoted to industrial training.

This effort of The Caney Creek Community Center to uplift the inhabitants of a mountainous Southern district illustrates the great need which exists throughout many sections of the country for just this sort of scientific aid and direction. Organizations conducted in the spirit with which The Caney Creek Community Center has undertaken its service will effect a long needed awakening among the backward members of our rural societies to a sense of individual responsibility and pride in improved sanitary conditions.

### MEDICAL NOTES.

DR. STRONG AS MEDICAL RED CROSS DIRECTOR.

—Dr. Richard P. Strong, professor of tropical medicine at the Harvard Medical School, sailed recently for Europe to undertake his duties as general medical director of the League of Red Cross Societies, which will have its headquarters at Geneva. This league is an international association of the Red Cross Societies of the nations of the world and will act as a centralized agency for the improvement of public health, the prevention of disease, and the mitigation of suffering in all countries.

Dr. Strong's experience has made him well fitted for his task. In 1913 he came as a brilliant student of tropical diseases in the Philippine Islands, where he had been stationed as an Army medical officer many years before, to the Harvard Medical School, where he was made head of the School of Tropical Medicine. In 1915, Dr. Strong became the leader of the international corps of workers who wiped out the typhus epidemic which the German invasion brought into Serbia. He then returned to Harvard for a year, but went back to Europe when the United States entered the war in 1917. During the war he was in charge of the division of infectious diseases of the American Expeditionary Forces, and of the investigations carried out upon trench fever. He also represented the American Ex-

peditionary Forces on the inter-allied sanitary commission. After the signing of the armistice, Dr. Strong directed the department of medical research and intelligence for the American Red Cross in Paris, and was instrumental in organizing the League of Red Cross societies, of which he is now to be the chief medical officer. In recognition of his services during the war, Dr. Strong was awarded the Distinguished Service Medal, the British Order of Commander of the Bath, and the Chinese Striped Tiger, and has been made an officer in the French Legion of Honor, and grand officer of the Serbian Cross of Saint Salva. He has been granted leave of absence from Harvard University for another year.

#### BOSTON AND MASSACHUSETTS.

**DEATHS FROM DIPHTHERIA IN MASSACHUSETTS.**—It has been announced that in order to aid in preventing unnecessary mortality from diphtheria, the State Department of Health has organized an educational campaign for the instruction of persons most in need of it. Bulletins have been distributed among school children and an appeal has been sent to all organized agencies who are interested in public health work to cooperate in attempting to improve local conditions. Upon request, State District Health Officers will be sent to discuss the diphtheria situation.

It has been estimated that during the past seven years about 650 students have died annually in this State from diphtheria. The knowledge which we have of the use of antitoxin makes these deaths needless. It has been found that in cases where antitoxin has been given on the first day, practically all have recovered; when administered on the second day, 95 per cent. recovered; on the third day, 87.5 per cent.; on the fourth, 78 per cent.; on the fifth, 61 per cent.; and on the sixth, less than 50 per cent. recovered. Of 1,000 deaths from diphtheria investigated, the State Department has found that 65 per cent. occurred in children who were not more than five years, and 25 per cent. had been ill for a week or more before medical aid was sent for. The necessity of recognizing the importance of a "sore throat" cannot be too strongly emphasized.

**INVESTIGATION OF NURSING EDUCATION.**—Miss Anne Hervey Strong, director of the School of

Public Health Nursing, conducted by Simmons College and the Instructive District Nursing Association, has been appointed to the Winslow committee for the investigation of nursing education, under the auspices of the Rockefeller Foundation. The investigation will be carried on for one year, under the direction of Miss Josephine Goldmark, and will undoubtedly be of great importance in the development of nursing education.

During Miss Strong's year of absence, Miss Loula E. Kennedy will be the acting director of the School of Public Health Nursing. Miss Kennedy is a graduate of Goucher College, Baltimore, and of the Johns Hopkins Training School. She had charge of the nursing in Dr. Grenfell's Mission Hospital in Labrador, and has been educational secretary of the Tuberculosis League of Pittsfield, director of the Department of Hygiene and Home Nursing in the Kansas State Agricultural College, and has recently been teaching in the Army Training School for Nurses at Camp Meade.

**WEEK'S DEATH RATE IN BOSTON.**—During the week ending October 18, 1919, the number of deaths reported was 203 against 763 last year, with a rate of 13.29 against 50.72 last year. There were 39 deaths under one year of age against 71 last year.

The number of cases of principal reportable diseases were: Diphtheria, 82; scarlet fever, 30; measles, 51; whooping cough, 16; typhoid fever, 5; tuberculosis, 53.

Included in the above were the following cases of non-residents: Diphtheria, 5; scarlet fever, 6; tuberculosis, 5.

Total deaths from these diseases were: Diphtheria, 3; measles, 1; whooping cough, 1; tuberculosis, 21.

Included in the above were the following non-residents: Diphtheria, 2; tuberculosis, 1.

Influenza cases, 9; deaths, 1. Last year, corresponding week, influenza cases, 1188; deaths, 463.

**BEQUEST TO SPRINGFIELD HOSPITAL.**—By the will of the late Mrs. Anna Chapin Rumrill, the sum of \$150,000 was bequeathed to the Frederick Wilcox Chapin Memorial Hospital, a branch of the Springfield Hospital.

**MASSACHUSETTS COMMITTEE FOR THE RED CROSS CHRISTMAS SEAL SALE.**—The following Boston men are included in the State Committee for the Red Cross Christmas Seal Sale, to be carried on for the benefit of anti-tuberculosis work:

General Clarence R. Edwards, former Attorney General Albert E. Pillsbury, Internal Revenue Collector Andrew Casey, Colonel Adam Gifford of the Salvation Army, President Edward O. Otis, M.D., of the State League, Louis Kirstein, of William Filene's Sons Company, Dr. Walter P. Bowers, secretary of the State Board of Registration in Medicine, and John L. Stevens, who represents the labor interests on the directorate of the Boston Elevated.

**COMMEMORATION OF ETHER DAY.**—The seventy-third anniversary of the first administration of ether was commemorated on October 16 at the Massachusetts General Hospital. Dr. Richard C. Cabot reviewed in an address the standards, achievements, and prospects of the hospital. In speaking of the material expansion of the hospital, Dr. Cabot is reported to have said that it is now possible to cut down the stay of patients in the hospital from eleven weeks, as it was in 1855, to about eleven days at the present time. Nearly one thousand doctors and others are now giving their services, either directly or indirectly, to patients. Dr. Cabot paid a tribute to the social service work at the hospital, which, he said, has now taken root in France through the efforts of the foreign branches of the hospital. Dr. Cabot emphasized the importance of taking a greater interest in the community outside of the hospital walls by assisting schools, courts, industrial plants and public authorities in checking disease. He also praised the research work of the hospital, which is being carried on under the direction of Dr. Edsall.

#### NEW ENGLAND NOTES.

**NO NEW ENGLAND ARMY HOSPITAL.**—Surgeon General Ireland, in discussing the advisability of restoring for New England soldiers a military hospital in New England, preferably at Devens, is reported to have given the following facts in explanation of the present status of military hospitals and as the reasons why it has been judged to be impossible to maintain a hospital for this purpose in New England.

On September 26 there were 20,250 soldier patients in the general hospitals of the United States. On the same date there was a total number of beds in the general hospitals amounting to 27,926. Thus in the hospitals now being operated there were 8,000 vacant beds. In view of this fact, the hospital at Plattsburg Barracks, New York, to which most of the New England soldiers were transferred when Parker Hill Hospital was closed and which was occupied by only a fraction of its full complement of patients—354—was closed on September 30. The soldiers who were patients there have in the main been transferred to the Fox Hills Hospital, Staten Island, New York. The hospital at Spartansburg, South Carolina, was also closed on September 30, when it had only six patients. Other hospitals, including hospitals at Williamsburg Bridge, New York, Colonia, Fort Des Moines Hospital, and Otisville, New York, will be closed within a short time because of the small number of patients. When these hospitals have been closed, there will be only fourteen general soldiers' hospitals in the United States. Of these, four are for tubercular patients and two for the insane. The other eight are permanent army hospitals which will be continued indefinitely, not being emergency institutions. These eight are the Letterman General Hospital, San Francisco; Walter Reed General Hospital, Washington; Fort McHenry Hospital, Baltimore; Fort McPherson Hospital, Georgia; Fort Sheridan Hospital, Illinois; Carlisle Hospital, Carlisle, Pa.; Fox Hills Hospital, Staten Island, New York; Fort Sam Houston Hospital, Texas.

The War Department is striving to centralize the hospitals as far as possible in order to re-establish them as nearly as may be on a peace basis.

**WAR RELIEF FUNDS.**—The principal New England war relief funds have reached the following amounts:

French Orphanage Fund	.....\$519,564.41
Italian War Relief Fund	..... 309,157.02
French Wounded Fund (for the	
American Memorial Hospital	
at Rheims)	..... 223,884.68
Russian Refugees' Relief Fund	93,616.05

**NEW ENGLAND TUBERCULOSIS CONFERENCE.**—The New England Tuberculosis Conference was held under the auspices of the National Tu-

bererculosis Association at the Narragansett Hotel, Providence, R. I., on October 16 and 17. The following addresses were included in the program:

Modifications in our Community Programs. Based on Recent Experience, by Dr. Donald B. Armstrong; Medical and Scientific Premises for a Progressive Program, by Allen K. Krause; Public Health Authorities, by Dr. Eugene R. Kelley; Tuberculosis Agencies, by Dr. Edward O. Otis; The Place of Tuberculosis in Public Health Teaching, by Dr. C. E. A. Winslow. Various aspects of the tuberculosis problem were discussed by prominent physicians.

### The Massachusetts Medical Society.

#### MEETING OF THE NORFOLK SOUTH DISTRICT MEDICAL SOCIETY.

The Norfolk South District Medical Society held a meeting at the United States Hotel, Boston, on Thursday, October 2, 1919. After the usual business proceedings, Dr. L. R. G. Crandon, Boston, read a "Report of a Reserve Officer in the U. S. Navy."

As a preliminary to his paper, he discussed the recent law which enables the Board of Registration in Medicine to take action against and suspend the license of a registered physician, giving the man the right of appeal only to the Supreme Court. He contended that there should be some means devised whereby a physician can receive the same privileges of stay and legal process that a layman receives for a Superior Court offence. As the law stands, the Board of Registration in Medicine is judge, jury, and executioner,—too much power for one body.

He divided his talk into two parts, the first, on the General Impressions of the Medical Officer in Naval Service, and the second, on Clinical Points of the work. The following is a brief extract of his remarks:—

Experience on active naval duty in wartime has been a revelation to the reserve officer. An admiral of the line once said to the writer, "When you enter the Navy, much more than you can believe depends upon your first associates amongst senior officers. The deck nearly always has a slant and the officers just above you either start you upward or downward and so you are likely to continue." In

the medical corps the push seemed to be always upward.

Some reservists expected to find the Medical Corps sharply military, extremely punctilious as to rank and precedence, perhaps not making the reserve officer altogether welcome. In short, we may have believed the Medical Corps to be more naval officers than doctors. The reverse has been the truth. Rank and precedence, outside of military or disciplinary need, were forgotten in all things clinical. We were all doctors, each with a right to be heard and weighed in the measure of his experience.

The examinations for enrolment were searching, complete, quite up to the standard of the best medical schools. They were conducted with promptness, dignity and precision. Occasionally an examining officer "barked" and was discourteous in order to "spring his rank," but he was always the junior man and would have had the same manners if not in the Navy. The physical examination was thorough: the stress of war showed no effect in haste or lowering of requirement. The high standard is in part, no doubt, the reason that the Medical Corps has never been full to its authorized strength.

"Paper-work" and the written relations of the newly enrolled officer to the Department was a revelation to the average doctor. He learned to write letters in military form (which should be universally adopted in commercial life): he learned to write with exactness, to mean precisely what he wrote and to waste no words. Health records and surveys were official documents with far-reaching matters of recompense and justice hanging on them. Written facts and opinions, sharply separated, must show their personal source not only, but also must go through official channels and thus carry out the real unity of the great organization. All this educated the new officer in an entirely new line and must reflect on his whole future in civil practice.

It shortly became apparent to the discerning reservist that the Medical Department was successfully following its plan of organization, namely, at the call for expansion to put the regular officers on military and executive work and to have the clinical work done largely by the reservists.

Better care men could not get than was given patients in the Navy in all respects: technical

skill, quality of food, medicines, sera, vaccines, apparatus, and instruments. Officers and hospital corpsmen followed their work day and night, and, during the influenza pandemic, the sick received attention that \$1,000 a week outside could not buy. Every letter, telegram, or inquiry from friends of patients received prompt and explicit reply. Relatives who came to the dangerously ill had free access, received every courtesy, in many instances were given quarters. No hint that political influence had a bearing ever came to the writer's notice. That the dead were well cared for is shown by letters of thanks from all over the country. There were several instances of public funerals held over a thousand miles from the place of death.

The sentence of courts martial seemed severe to the civilian mind, though the rule to mitigate all fines after probation neutralized this severity. It seems that when such great ranges of sentences are allowable, the accused should be entitled to more expert representation and advice than he gets.

Clinically, with always a large number of medical minds to review a given case, few mistakes "get by." The *furor operandi* in certain officers has to be checked, but it is no worse than in civil practice, except that the patient does not feel quite the same freedom to refuse treatment in the service that he may as a civilian. The only frequent clinical error was a tendency to lay rheumatism to a disease arising from the patient's misconduct, rather than to the tonsils and teeth, so constantly guilty. More general x-ray instruction to officers is sadly needed. The more skilful and better clinical officers in some way should be relieved of paper and executive work and assume the status of civilian consulting surgeons. It may seem that grounds for adverse criticism are hard to find. It is quite apparent that the Department was ready for the recent emergency, rose to it, and made good. The reservist congratulates the regular.

Clinical impressions are here noted in brief. Following E. H. Place of the Boston City Hospital, who removes tonsils in scarlet fever as soon as initial fever is passed, Dr. Crandon went farther and removed all inflamed tonsils in acute tonsillitis and peritonsillar abscess, with 100% good results. The surgeon works behind a narrow vertical plate glass screen. Unruptured third molars were removed in large

numbers, for near and distant neuralgias. In empyema, operation was delayed to establish as high an immunity as possible. The "Walter Reed" technique was used. Where the fluid was very toxic or embarrassing in its amount, it was drawn off through a large aspirating needle, and two ounces of a solution of 2% formalin in glycerine instilled at once through the same needle. This procedure is repeated every two to five days till either (1) no more fluid is formed and the cavity is sterile, or (2) when the fever is gone, a thoracostomy may be done without shock.

### Miscellany.

#### REDUCING MATERNAL MORTALITY: A PLEA FOR BETTER TREATMENT OF UNMARRIED MOTHERS.\*

IN several of our recent Bulletins we have pointed to the frequent association of criminal abortion with a high maternal mortality rate. It is obvious, therefore, that efforts to reduce high maternal mortality should consist largely on an attack of the causes of criminal abortion. This problem is beset with so many difficulties that a helpful discussion such as that recently conducted in London by the Child Welfare Council of the Social Welfare Association is sure to be welcomed. We accordingly abstract the following from the *Lancet* of February 23.

After calling attention to the high infant death rate among children born out of wedlock, and placing the number of illegitimate births in Great Britain at approximately 50,000 a year, the article deplores the present manner in which society treats the unmarried mother. "From the public health aspect there has never been any excuse for the differential treatment of different groups of necessitous mothers. The interest of the child is paramount. But those who fear that any relaxation of 'deterrent' methods in regard to illegitimate parenthood may result in its increased frequency should look at all sides of a situation which is undergoing rapid changes. The means of preventing conception and of arresting embryonic life at its early stages, are, for better or for worse, becoming the common knowledge of the workers of this country."

\* From the weekly Bulletin of the New York City Health Department, April 7, 1918.

Impregnation or the opportunity for it having taken place, it may therefore be morally the more courageous, as it is hygienically the more fitting, thing for the unmarried mother to take the risk of bearing a child. The fear of public disgrace may simply result in action which blunts the private conscience. Some of these views were presented with force at a conference on provision for unmarried mothers and their children convened at the Mansion House on February 14th by the Child Welfare Council of the Social Welfare Association for London. Marked harmony characterized the proceedings of this conference, beginning with Sir Charles Wakefield's sympathetic opening address and ending with a unanimous decision to form a National Council for securing better provision for mother and child on the lines laid down in the following recommendations:

1. That any scheme adopted should be elastic and not exclude any mothers in need; whether married or unmarried; should be carried out in conjunction with the health authorities and existing societies, and be linked up with maternity and infant welfare work; and should enable mothers to keep their babies with them for at least two years.

2. That provision should be made in the following forms: (a) waiting homes for expectant mothers; (b) maternity homes; (c) allowance for mothers whose circumstances and home surroundings make it desirable for them to continue to live at home; (d) residential accommodation, with day nurseries attached, for mothers (with babies) who wish to live with their babies and go out to work; (e) foster-mothers, small homes, or adopting parents for the babies of those who cannot keep their children with them; (f) special homes for mothers suffering from such defect or diseases as should preclude them from keeping their children with them.

3. That the cost of the provision recommended should be met partly by grants from Government departments and local authorities, and partly by voluntary subscription and payments from the mothers, but in no case by the Poor-law authorities.

A new National Council may seem to some to be superfluous, but from the figures which we began by quoting it will be seen to have each year 50,000 births to deal with and some thousands of avoidable deaths.

## NOTICE.

**BOSTON CITY HOSPITAL.**—The first of the monthly clinical meetings of the Boston City Hospital, for the year, will be held on Thursday, Nov. 6, 1919, at 8.15 P.M., in the Cheever Surgical Amphitheatre. To this and succeeding meetings, to be held on the first Thursday of the month, the profession, graduate and undergraduate, is cordially invited. Each meeting will consist of an informal presentation and discussion of a timely subject, followed by the demonstration of clinical material of unusual interest. Light refreshments will be served after the meetings.

November 6, 1919.—The Treatment of Empyema. Discussions by Dr. Whittemore of the Massachusetts General Hospital, and Doctors Cotton and Locke. Case presentations.

## SOCIETY NOTICE.

**BRISTOL SOUTH DISTRICT MEDICAL SOCIETY.**—The semi-annual meeting will be held at the Public Library, New Bedford, on Tuesday, November 6, at 5 P.M.

Dr. A. J. A. Hamilton, of Boston, will read a paper on Pathology and Surgical Treatment of Gastric and Duodenal Lesions. Illustrated.

The Censors will meet at 3.30 P.M., to examine Drs. C. C. Nevin, of Edgartown; L. J. Pobirs, of New Bedford; E. L. Merritt, R. P. MacKnight, and E. T. Learned, of Fall River, for membership.

A. J. ARBE, *Secretary*.

## RECENT DEATHS.

DR. HORACE PERKINS MAKECHNIE, a retired Fellow of the Massachusetts Medical Society, died suddenly of heart disease, at his home in West Somerville, October 16, 1919, aged 78 years.

Dr. Makechnie was born in Ripley, Maine, April 15, 1841. He was graduated from Tufts College in 1865. He became principal of the Green Mountain Institute in Vermont and later went to Somerville and became principal of the Old Lincoln School.

In 1879 he was graduated from Bellevue Hospital Medical College in New York and, after practising for a short time in Cambridge, removed to West Somerville.

Dr. Makechnie was formerly president of the Somerville Medical Society, and he had been a member of the staff of the Somerville Hospital since it was started. He was a member of the Massachusetts Medical Society, the New England Historical-Genealogical Society, and several fraternal organizations. He is survived by his widow and two sons, Ernest H. Makechnie, a musician of Somerville, and Dr. Arthur N. Makechnie of North Cambridge.

DR. DAVID BERNARD VAN SLYCK died in September, 1919, at his home in Pasadena, California, at the age of 90 years. Dr. Van Slyck was born in New York and practiced in Brookline, Mass., from 1876 until 1887. He was graduated from the University of Buffalo Medical Department in 1832. He was a former president of the Southern California Medical Society, and resigned from the Massachusetts Medical Society in 1887. He served through the Civil War with the 101st New York Infantry and the 22nd New York Cavalry, and was medical director of the Army of the Shenandoah. He is survived by his widow, Mrs. Agnes M. Van Slyck.

DR. EBENEZER FARRINGTON SPAULDING died on Oct. 18, at the age of 84 years. Dr. Spaulding was born in Framsetown, N. H. He studied at Rush Medical College, Chicago, in 1861, and received a medical degree from Harvard Medical School in 1866. From 1857 to 1860 he was a master of a grammar school in Janesville, and from 1862 to 1865 he served as assistant surgeon with the 7th Wisconsin. Dr. Spaulding began practising in Boston in 1869. He married Miss Ada H. Pearson of Janesville, Wisconsin, in 1864.



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## Original Articles.

### SILENT RENAL CALCULI.

By EDWARD L. YOUNG, JR., M.D., BOSTON.

IT is a well-known fact that renal calculi exist which give few if any symptoms, since they are occasionally shown by the x-ray when some other lesion is being studied or the discovery of albumin or a few pus cells by a life insurance examiner results, on closer study, in revealing their presence. How frequently these so-called silent calculi occur and how much damage they cause the kidney are not so well known.

A question of equal interest and likewise one about which there is very little accurate data is that concerning cases in which non-operative treatment has to be considered: how long can a stone known to exist in a kidney be left without serious damage to the kidney? Can damage occur without showing signs in the urine?

In hopes of getting a few facts to help out on these questions I have gone through the literature of the last few years and have also looked over 4,000 autopsies done at the Massachusetts General Hospital since 1896, and where stones were found I noted the gross and

microscopic condition of the kidneys and correlated these data with the clinical symptoms and urinary findings.

In the textbooks and literature on renal calculi it is assumed, and I believe correctly, that a stone is a potential if not at the time an actual cause of damage, and as such should be removed. But in a few of the more recent articles there are statements as to what the author believes is sufficient reason for not operating.

Braasch says that when a stone is 1 cm. or less in diameter it is a question whether operation is needed or not.

Kretschmer, without giving any figures as to size, says that with small stones intervention is unnecessary.

Bevan says that if a stone is one-half inch or more in diameter operation is necessary. He also says that "the trouble given by kidney stone varies tremendously. I have seen a number of cases where the kidney stones had existed for years and where they were simply innocuous and where they gave rise to no symptoms whatever. We cannot properly insist upon operation for removal of kidney stones merely because we have definite evidence of their presence."

William J. Mayo speaks of the large branched calculus where removal would mean much kid-

ney destruction, and says he has seen "several cases of their description who have gone for years without apparent progress of the disease."

Furniss, in writing about the damage done by renal calculi, says that it is entirely due to obstruction and infection and that stones in calyces cause little damage.

Kraft, as quoted by Keys, found forty cases of renal stones in 2953 autopsies and his conclusions are as follows: "If calculus remains imbedded in the cortex, the pathological changes may be slight or absent, and when they do occur they are due to infection. If the stone is in the pelvis or calyx it almost always produces more or less well marked pathological changes and invites infection."

Since 1896 there have been 3960 autopsies at the Massachusetts General Hospital and in 45 cases stones were found in the kidney or ureter or both. Of these cases seven were cases which had been operated on for stone and one small stone out of many or a fragment from a large stone had been lost in a pyonephrotic cavity, or in a bilateral case one side had been done and the second side was to have been done at a later operation. There was one case with calculous pyonephrosis who died without operation. In all these cases there were known to be stones and known to be renal damage so that these eight cases are not discussed. This leaves 37 cases where stone was discovered at autopsy in patients who were in the hospital for some other condition. In three of these, stones were known to be present but had nothing to do with the condition from which the person suffered and which was the cause of death.

Considering the clinical side of these cases first, there were 24 patients who had no symptoms pointing toward the kidney or at least none which they thought worth speaking about. Of the 24 cases only four had a negative urine. Of the remaining 20, 13 had a slight evidence of trouble in the urine such as a slight trace of albumin and a few pus cells or even less; six had much albumin and pus, while one had no urinary examination recorded, in the short time before death. Six of the 20 with positive urinary findings had another urinary lesion (four obstructing prostate and two stricture with perineal sinns) which might well cause the changes noted in the urine. Nine patients had symptoms which, on looking back, should

have pointed to the diagnosis, especially as eight of these had albumin and pus or blood or both in the urine, and seven of the nine died of renal insufficiency and sepsis. With all of these seven I believe a diagnosis could easily have been made if symptoms other than those pointing toward the kidney had not seemed so important as to push the kidney picture into the background.

The pathological record of these kidneys is interesting inasmuch as it does not always correspond entirely with the urinary findings. The stones were bilateral in seven cases out of the 37 and multiple in 20, and varied in size from one to two mm. in diameter up to large branched calculi filling and almost completely destroying the kidney.

There was only one stone in the cortex and this was not a stone but a hard piece of bone one-half inch in diameter. It was in a kidney showing early tuberculous and was not itself causing any gross damage. The remainder were almost equally divided between ureter, pelvis, and calyces; 16 times in the pelvis, and 13 times each in ureter and calyces.

In 15 cases there was no gross damage to the kidney but in nine of the 15 there was a definite statement about slight dilatation of the pelvis or calyces or microscopically there was some increase of interstitial tissue "with slight atrophy of renal elements." The largest stone in this series was four and one-half cm. in diameter. One was called large but no dimensions were given. Of the 15 only two were ureter stones, and in one of these there was beginning dilatation of the pelvis. The other was in a small pocket in the ureter and only slightly obstructed.

In the remaining 22 cases there was more or less damage up to complete destruction of the kidney.

In five cases there was a chronic interstitial nephritis present but it was always a bilateral process and apparently had no causal connection with the stone. In one case, after a detailed study of the kidney, the pathologist ended by saying, "This process can in no way be considered secondary to the stone." Microscopic examination of kidney tissue in the cases with no gross damage showed in several instances "slight atrophy of renal elements" or slight arteriosclerotic changes, but in six cases, two of them containing large stones, there is no macroscopic or microscopic change.

In comparing the clinical and pathological aspects we find that one case who was known to have had a stone for six years had a negative urine and a normal kidney. Another case who had passed stones for at least seven years had a negative urine, and aside from a very slight dilatation a normal kidney. Of the four cases without symptoms and with negative urinary findings only one showed an entirely normal kidney; it contained many small stones in pelvis and calyces. The other three were, however, essentially normal, some interstitial change and atrophy of renal elements being the only thing noted. In two the stones were small, but in one it was one and one-half inches in diameter. Of the 15 where the pathologist found no evidence of sepsis the urine contained pus in nine. Of the six where the pathologist found no gross or microscopic evidence of trouble the clinician found pus in three.

#### CONCLUSIONS.

In nearly 4,000 autopsies at the Massachusetts General Hospital showing stone in the kidney or ureter, there was only one case with a completely negative history and urinary findings and normal kidney macroscopically and microscopically; but there were four cases without symptoms and with a negative urine; six cases without any damage to be demonstrated at autopsy; and 15 cases where the damage was too slight to compromise the integrity of the kidney.

Two cases with stones in calyces known to have been present for at least six or seven years, who had had repeated attacks of renal colic, showed one a normal and the other an essentially normal kidney.

Stones in the ureter more surely do kidney damage than stones in the pelvis or calyx, and a small stone if arrested in the ureter may do as much damage as a large one. Stones in the calyces can cause as much damage as stones in the pelvis.

Pus can be present during life without any evidence of infection or damage at autopsy, so that the presence of infection as well as of pus is necessary before important kidney damage is proved to be present.

The presence of a stone of any size in ureter, pelvis, or calyx may cause slight tissue changes, characterized microscopically as, "slight increase of interstitial tissue," "slight arterio-

sclerosis" or "slight atrophy of renal elements," but these lesions are not constant, and apparently are of little if any account so far as the work of the kidney is concerned; aside from this there is no damage done the kidney by the stone as such. But the vast majority of renal or ureteral stones do at some time or other cause some obstruction and always invite infection and accordingly are sources of danger to the individual.

There is no arbitrary standard by which we can say that a given renal stone may or may not have to be operated on. But in any given case without infection or other evidence of kidney damage a calculus may be left alone until it is passed, until pain forces an operation, until evidence of infection and damage begin, or until it is shown to be increasing in size so that a pyelotomy becomes more difficult. In the case of a ureter stone, if in spite of cystoscopic manipulation it has ceased to make progress, it should be removed after remaining stationary for only a relatively short time, in spite of possible lack of symptoms, as the kidney is almost certainly going to be badly damaged.

#### A SERIES OF 100 CONSECUTIVE ACUTE EMPYEMATA.\*

BY WYMAN WHITEMORE, M.D., F.A.C.S., BOSTON.

THE series of 100 consecutive cases of acute empyema which I have chosen to bring to your attention today extends back over a period of a year and eight months, dating from the middle of this last April. Ninety-two of these cases were operated on at the Massachusetts General Hospital and eight outside. During this time I have operated upon every case offered to me with one exception. This one case died within half an hour of the time that I saw him. Being my own personal cases, I feel that I can criticize the results and mistakes very freely.

As I have tried to make this paper very brief, I shall not go into statistics any more than is unavoidable but will show the immediate results obtained by the different surgical procedures used. Many of the cases having been operated upon recently, it is impossible to report the final results as to what cases became chronic.

\* Read before the Second Annual Meeting of the American Association for Thoracic Surgery, at Atlantic City, June, 1919.

I expected to have a series of 100 empyemata in which no cases were operated upon by means of the old open rib resection, where nothing is done during the after care to sterilize the pleural cavity. But in order to have a series of 100 I have had to include nine such cases. These I wish to dismiss immediately, as although none of the nine died, yet this method when in use at the Massachusetts General Hospital gave a mortality of about 20%, and I no longer believe in it.

The three techniques used in the remaining 91 cases are based on attempting first to get the lungs to expand and thereby do away with the empyema cavity, and second to get the pleural cavity sterile.

The methods used were:—(1) Dr. Lilienthal's operation, (2) the Carrel-Dakin technique, (3) the closed suction method.

In 14 cases Dr. Lilienthal's operation was performed with extremely good results, 12 of them doing very brilliantly. All were kept in the hospital until entirely healed, the shortest case staying 18 days and the longest four weeks. One of the remaining two cases returned to the hospital after 10 days with more pus in her chest. She cleared up rapidly with the use of Dakin's solution. The remaining case was a real hard-luck story. It was a baby. When I saw him on the afternoon following operation he was sitting up eating his supper. The following day he was playing in his crib and was in excellent condition. The next day while I was making a visit he had a convulsion, became paralyzed on one side and died that afternoon.

It is only fair to say that these cases were carefully selected as being suitable for the Lilienthal operation. They were all pneumococcus cases and did not give the appearance of being very septic. They were all operated on under gas oxygen and the lung expanded beautifully. I thoroughly approve of this method in certain selected cases, but never in streptococcus cases or those empyemata following influenza.

I prefer to sew up the original incision tight, as it is never made at the bottom of the pleural cavity, and to introduce at the bottom of this cavity an air-tight suction arrangement. I believe this makes the drainage more completely air tight than a cigarette wick at either end of the incision, and one can use Dakin's solution later if necessary.

This group had, as you have seen, one death in 14.

Only 11 cases have been operated on by the Carrel-Dakin technique, and the results were not very brilliant. The best case healed up and left the hospital in three weeks. When finally healed, some of the other cases had a considerable cavity, but one which was sterile.

We tried not only putting Carrel tubes into the cavity through the original incision but also through a second incision at the top of the cavity, but as we found that the top was often under the scapula, any movement of which tended to pull the tubes out, we finally gave this up.

We also gave up the secondary suture of the wound, as in several cases the empyema recurred, and we prefer to continue irrigation of the sinns until it is closed.

At present I am using this technique only in the small encapsulated empyemata.

Eight cases of this group of eleven finally got well, the shortest being three weeks, the average six to seven weeks, and two have not healed up even after several months. Two cases developed secondary encapsulated empyemata. These are the only two in the whole series which did. One case died. This was a man in the 50's, whose condition I thought better than it turned out to be, and resected a rib under gas oxygen. He promptly developed pneumonia on the other side and died in four or five days. I consider his death entirely my own fault, as I should have done the operation under local anesthesia.

If with this technique we could sterilize the cavity and close the wound in a week or 10 days and then have the lung fully expand,—I should consider it excellent,—but so far we have been unable to accomplish this.

The remaining 66 cases were operated on by a closed air-tight method; the success of this method and the method itself are my main reasons for bringing this subject before you.

For years I had been dissatisfied with the old resection of a rib and open drainage, as the lung could not expand readily against positive pressure, and the various valve apparatus did not appeal to me. About two years ago, Dr. Meyer, in reading a paper in Boston on bronchiectasis, dropped a hint about drainage of the pleural cavity by this method. At about the same time an electrical suction pump was perfected by a Boston surgeon's chauffeur and we began using it on other surgical cases. I

was interested to try it in the acute empyemata.

The principles of this treatment are based on first, early operation; second, the necessity of allowing the fluid to escape slowly; third, the sterilization of the pleural cavity by means of Dakin's solution; fourth, the suction of the pleural cavity; and fifth, the prevention of a considerable pneumothorax.

I realize that many surgeons believe in repeated aspirations first and delaying operation until there is thick pus. I should agree with them provided there were no other technique than that of the open drainage. But with an air-tight closed method I believe in early operation. This is done when the fluid aspirated is turbid, contains 60% or more polymuclear leucocytes and the organism causing the empyema. In delayed operation there is more danger of septicemia, pyemia, and pericarditis.

I believe it is necessary in many cases in which there is a very large amount of fluid in the pleural cavity to allow it to escape slowly, as when the fluid escapes very rapidly there is danger of collapse and even death.

Sterilization of the pleural cavity is done by means of Dakin's solution and its progress is, of course, determined by bacteriological count.

The suction apparatus is of great aid in the irrigations.

When the cases—in which the technique has been carefully carried out—are sterile and the sinus closed, the x-ray has failed to show any pneumothorax at all in many cases, and in others a very small one in the space between the diaphragm and the costal border.

The operation has always been done under local anesthesia,—with the exception of two or three children,—but it has been done with many babies a year or more old with perfect ease. It does not take more than five or six minutes and there has never been any shock to it. A large trocar—the cannula of which will admit a 21 or 22 French catheter—is introduced between the 8th and 9th ribs after a small incision has been made through the skin and usually the external intercostal muscle. The catheter, being shut off with a hemostat, is rapidly slipped through the cannula.

At this time the cannula is tilted with fluid rushing out, and I do not believe any air can enter into the pleural cavity. The catheter is sewed in tight and connected with a long rubber tube going into a bottle containing water,

and the end of the tube is kept under the surface of the water.

The success of the after-care depends on intelligent individual treatment. The fluid is allowed to escape slowly, this being regulated by the hemostat. When the fluid has stopped coming out by itself, which in large empyemata may take 24 hours, the suction pump is attached and the cavity sucked dry. At this time Dakin's solution irrigations are started and these are kept up every two hours. Needless to say, the private patient with specially taught nurses makes a more rapid convalescence than the ward case in a large general hospital.

It is probably safe to discontinue treatment and consider the case sterile in the pneumococcus cases when the bacteriological count is one organism per five or six fields, but I prefer to continue treatment for a few days more until there are none. This applies not only to the cavity but also to the sinus. It is proved by both the count and culture. In the streptococcus cases, I believe, it is necessary to get rid of every one before stopping treatment.

I do not want to give the impression that I consider this method a final cure for every acute empyema, as occasionally there is a case whose count, at the end of four or five weeks, stays up as high as four or five organisms per field—just why I do not understand. In these cases a rib has been resected under gas oxygen and a very small cavity has been found. When packed open with gauze it has promptly healed up. I have found that the best rib to resect is the one just above the sinus, although it is the 8th, as the diaphragm has always been found up at the level of the drainage.

I can speak definitely only of the immediate results, but I feel morally sure that cases proved to be sterile and that healed before leaving the hospital will not recur.

Of the 66 cases 54 got well without further operation; six needed a secondary operation and promptly healed up. Two streptococcus cases became chronic and left the hospital with small drainage tubes. Four cases died, three of which I should not have touched and would not have had I been anxious of my statistics. Two were streptococcus hemolyticus cases, both unconscious, and I was overpersuaded by their families. The other was a baby less than a year old, with double pneumonia and practically no chance. The fourth death was a tragedy. He was a man with double

broncho-pneumonia following influenza, and was delirious. For 10 days after operation he did well, his pneumonia cleared up and his delirium ceased. I thought him well on the road to recovery. Unfortunately, the suction pump was started and allowed to run for an hour and a half with no one in the room. At the end of this time he was in a state of collapse and died in three or four hours. There was no autopsy performed, but I presume he had some pleural reflex that tended to inhibit his heart action.

As I said in the early part of this paper, I cannot tell you how many cases became chronic. But up to the present time only one case has returned to the hospital, and this case got well without further operation by means of Dakin's solution.

The series was remarkable for its freedom from complications following operation. Three babies developed bronchopneumonia that gradually quieted down. One case had an obscure pleural reflex during his irrigation with Dakin's solution. This man had been irrigated for three weeks and then suddenly—out of a clear sky—collapsed and nearly died while being irrigated, the irrigation being done exactly the same way and by the same man as it had always been done. However, he finally recovered.

In some cases the Dakin solution set up violent coughing; this usually quieted down very quickly, but in several cases it was found necessary to discontinue it. A few patients complained of immediately tasting Dakin's as soon as an irrigation was started, this undoubtedly being due to a pleuro-pulmonary fistula. One case had an acute appendix during his convalescence. This was operated on and he recovered all right. No case had any severe bleeding from the pleural cavity, but in many the irrigation was tinged with blood from time to time; and no case developed pericarditis, septicemia, or pyemia.

Quite naturally the six patients who died in this series of 100 cases are the ones who have left the most vivid impression on me. Two of them, I am convinced, should not have died. In one of these death was undoubtedly due to the bad management of the suction apparatus, and in the other case, if the closed method had been done under local anesthesia, I believe the patient would be alive today. I feel that the death due to cerebral complication was unavoidable,

and probably that of the infant with double pneumonia could not have been prevented. The remaining two who died were moribund when seen.

There may be some one here who is skeptical as to the efficacy of this method, and to him I would say that even if it has not cured every case, yet it has a distinct contribution to make towards ultimate recovery, as it will often tide a patient over his extreme septic condition, and any operation that is needful can be done later on.

In conclusion I would emphasize my firm belief in early operation by means of a closed air-tight suction technique done under local anesthesia and followed by the intelligent use of Dakin's solution.

### ENCEPHALITIS LETHARGICA.

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ENCEPHALITIS LETHARGICA is an infectious disease of the central nervous system, usually of sub-acute onset, of which the predominant clinical characteristics are lethargy or somnolence and paralysis of certain cranial nerves, especially the motor oculi and the facial.

While undoubtedly existent prior to 1917, the affection has aroused universal attention on account of its prevalence in epidemic proportions in Europe and America in 1917 and 1918, not only in civil life, but also among the troops of the Allied Forces. It is probably identical with the affection described by the Italians under the term "Nona," which prevailed in 1890 in various parts of Europe.

The evidence at present at hand indicates that the disease is due to an infectious agent, not as yet identified.\* It is frequently preceded by one of the common infectious diseases, especially parotitis. Whether this is more than a coincidence is questionable.

*Incidence.* Seasonable: The affection, in its epidemic form, usually occurs in early spring, the months of March and April apparently showing the great prevalence, but sporadic cases may appear at any time of the year. Sex:

\*Since the above was written Leese and Strauss claim to have isolated a filterable organism, from the nasal washings and mucous membranes of humans, and from brains of animals, that produced in animals lesions typical of the disease. Cultures were carried to the seventh generation. Cultural methods were identical with Noguch's method for spirochetes. *Journ. C. M. A.*, 1919. Vol. LXVIII, p. 1056.

It shows no special sex incidence. Age: It is common in childhood, but manifests no particular incidence for that period of life. It occurs in nursing infants.

*Clinical Symptoms.* The affection is usually characterized, especially in children, by a prodromal period of from one to five days, occasionally considerably longer. The prodromata consist of headache, vertigo, blurred vision, muscular weakness, and a slowly increasing somnolence or lethargy. In many cases early diplopia is complained of. General pain or occasional abdominal pain may occur. Nausea and sometimes vomiting are among the early symptoms. Muscular twitching or tremulousness is also occasionally seen in this stage. In a small minority of instances the early somnolence is replaced by restlessness or irritability of the sensorium and a tendency to delirium exists. Photophobia and complaint of pain in the eyes are not infrequently a source of discomfort in this early stage.

Of interest in the prodromal or pre-prodromal period is the occurrence, occasionally, of light inflammatory affections of the mucous membranes or of the conjunctivae.

Usually these early symptoms very gradually merge into the fully developed stage of the disease, but occasionally a period of distinct amelioration of the phenomena intervenes before the full unfolding of the clinical picture takes place.

As this latter stage is approached the patient will usually be found to have a slight rise of temperature, 99 to 101. This is apt to increase to 102 or 103, and to last from three to six days. Sometimes the maximum is more quickly reached and as quickly subsides, with perhaps subsequent evening exacerbations for a time. There are exceptions to this rule, in which the fever may be pronounced, or may endure for many days, but this is not common. Whether afebrile cases occur is doubtful, and it is probable that the rise of temperature in some cases is very early and transient, and therefore overlooked. It is in this early febrile period that fleeting cutaneous eruptions, usually erythematous, but sometimes petechial, purpuric, or even papular, are occasionally seen. They may lead to error in diagnosis. Desquamation may follow these eruptions.

With the advent of the fully developed stage of the disease the somnolence and lethargy

reach the degree in which the patient can still be aroused but immediately lapses again into stupor if left to himself. A striking feature of this period is the mask-like facies, which has been compared to that seen in paralysis agitans. This is evident even when the patient can be induced to speak, and when at rest the facial lines are quite obliterated. At this stage, and sometimes earlier, the speech becomes slow, monotonous, nasal, and often slurred or hesitant. With the increase of stupor the patient lies expressionless and immobile and on passive movement considerable rigidity in the limbs and posterior cervical region may be present. A catatonic condition has been reported in a number of instances (*flexibilitas cerea*) but this is not a frequent feature of the syndrome. The stupor may deepen into actual coma, although the majority of cases do not reach the stage from which they cannot be aroused.

In approximately three-quarters of all cases the characteristic palsies of the third and seventh nerves occur and are prone to appear in this period, towards the end of the first week or in the early part of the second week of the disease. Their onset is usually gradual, and as a rule ptosis is the first sign indicating implication of the third nerve nuclei, either unilaterally or bilaterally, the involvement usually spreading to the other ocular muscles supplied by the third nerve, with resultant strabismus (external) or subjective complaint of double vision. The sphincter iridis may or may not show involvement. This implication of one or both series of ocnomotor nuclei may be the only focal symptom, but in half of the English cases, both adults and children, occurring in 1918, this was associated with single or double paralysis of the facial nerve as well.

Both the ophthalmoplegia and the facial paralysis may clear up on one side before appearing on the opposite side. The facial involvement is often preceded by considerable twitching in the facial muscles. Either form of paralysis may clear up and then recur, and both may be late symptoms, occurring after the disease has existed for several weeks. Nystagmoid unsteadiness of the eyeballs is sometimes seen.

The fourth, the sixth, and the twelfth cranial nerves may also be implicated, and one case of involvement of the eleventh is reported. The frequent presence of nasal voice, nasal regurgitation and difficulty in swallowing and articulation, indicate involvement of the ninth

and tenth cranial nerves as well. In fact practically all of the motor cranial nerve nuclei are susceptible to the disease. About one-fourth of the cases do not present cranial nerve implication. Such cases, however, are often equally severe in their other clinical manifestations. They are also the cases in which the diagnosis is often difficult.

As might be expected in an affection so prone to involve the region of the crura, pons, and medulla, cases occur in which some interference in pyramidal transmission is evident. Instances are surprisingly infrequent in which anything like a spastic paralysis appears, and this is in striking contrast to the common results of ordinary acute encephalitis. That pyramidal transmission is to some extent interfered with is, however, evidenced by the greater or lesser degree of general muscular rigidity often seen and by the retention of urine and exaggeration of deep reflex activity occasionally present. Constipation almost invariably prevails and is obstinate. Late in the stage of coma, when it occurs, both rectal and bladder incontinence may supervene. Tremor is a conspicuous feature of most cases, and may be an early and constant phenomenon. More irregular involuntary movement of choreic or athetoid character may occur.

The affection is conspicuously free from signs of meningeal irritation. Beyond cervical rigidity and the *tâche cerebrale*, both of which are infrequently present, the clinical picture presents no distinctively meningeal phenomena. Kernig's sign is not found as a rule. Optic neuritis has not been observed. Slight engorgement of the retinal vessels has been noted in one or two cases. Sensory symptoms, other than the pains above referred to, have been absent except in a few instances, all in adults, in which the phenomena point to a polyneuritis. The cerebrospinal fluid is almost invariably clear, rarely under pressure, and rarely showing increase of albumen. In about one-third of the cases, in both adults and children, a lymphocytosis is found. In all cases where examined culturally the fluid has been sterile. Further critical examination of the fluid, with particular reference to the period of the disease at which the fluid is taken, is essential.

*Course and Prognosis.* The duration of the clinical phenomena is so variable and convalescence is so prolonged that it is difficult to give even an average duration for the affection. In

Batten and Still's series in children the average duration of the stage of stupor was from three to five weeks. The emergence from the lethargy and the restoration of general strength is extremely slow. Eliminating the abortive cases, it is safe to set six weeks as the minimum duration of the disease and its immediate results, and in the majority of cases many weeks, and even months, may pass before full restoration to health, if it eventually does occur, is achieved. As in other forms of encephalitis, impairment of intellect, especially in children, may remain. Among other sequelae tremor and disturbances of coördination are conspicuous. The tremor may be of the paralysis agitans type or it may be of finer degree. It may be general or chiefly evident in the extremities. The ataxia is commonly of the cerebellar type, and is particularly noticeable in the gait. Considerable ataxia for finer movements of the fingers, however, is frequently present. Less often do the bulbar disturbances persist. As a rule the ocular palsies eventually disappear during the convalescence and the same is true of the facial palsy. Disturbances in swallowing or in speech may be more or less noticeable for a long time but they, too, are rarely persistent after complete convalescence. Lack of emotional expression in the face often persists for a very long time, leading to the assumption of mental dulness, which is not justified by the facts.

*Mortality.* The mortality for all cases appears to be about 20%.<sup>\*</sup> It reaches its maximum in the period between thirty and forty years, when it is four times as great as it is in the first decade of life. This is a striking contrast to anterior poliomyelitis. Until a much larger number of cases in childhood are on record it will be impossible to form any accurate conception of the mortality for early life. The shortest duration of a fatal case during the English epidemic was two days, in a child of twenty-one months, the longest duration before death was forty-nine days, in an adult of thirty. Death results from bulbar paralysis or from broncho-pneumonia. It is sometimes preceded by convulsive twitching. Marked increase in intensity and frequency of delirium, and deepening coma are to be regarded as unfavorable signs as a rule, but this is not necessarily the case. Cheyne-Stokes respiration is always an unfavorable symptom.

<sup>\*</sup> Much higher figures than this have been reported, but based on too few cases to be reliable.



*Pathology.* Macroscopically but little may be seen. More or less hyperaemia may be visible, here and there in the meninges. In the region of the interpeduncular space, however, a limited area of meningitis is usually present. Occasional areal patches of similar character may be found elsewhere. On section of the brain and especially sections through the basal nuclei, peduncles, pons, and medulla, punctate hemorrhages are to be seen. Occasionally larger areas, apparently of confluent hemorrhages, may be visible. Microscopical examination shows these hemorrhages to be chiefly of venous origin. Intense hyperaemia of the vessels and perivascular infiltration with lymphocytes, plasma cells, and fibroblasts is present. This condition is usually especially pronounced in the region of the peduncles and in the pons (floor of the fourth ventricle). Marinesco, who examined specimens from several of the English cases, states that there was no obvious necrosis of the vessel walls to which the hemorrhages could be ascribed. There was intense cellular infiltration of the adventitial wall of the vessels. Also, but more rarely, there were areas of cellular infiltration of the gray matter of the pons. Miliary hemorrhages were very numerous in the neighborhood of the floor of the fourth ventricle, in the formatio reticularis and in the gray substance about the Sylvian aqueduct, the locus coeruleus, substantia nigra, etc. The vessels of the meninges in the region of the pons and medulla showed similar inflammatory conditions. Some capillary hyperaemia was found in certain areas of the cerebrum, sometimes associated with hemorrhages in both meninges and gray matter, but these were of minor degree when compared with the process at the base.

In one of Marinesco's specimens there was marked evidence of meningoencephalitis of the upper cervical cord. In another the process commenced at the level of the pyramidal decussation and the cord was unaffected. In the two cases in which the cerebellum was obtainable Marinesco claims to have found profound lesions in the cells of Purkinje, no cells being found that appeared absolutely normal. They showed acromatous and degenerative changes, with some disappearance of neuro-fibrillae. Nissl bodies were entirely gone, the cytoplasm pale, usually homogeneous, occasionally slightly granular. He considers these changes primary and not secondary to lesions of the axones.

Golgi's cells were but little affected. The small vessels of the cerebellar cortex were hyperaemic, the endothelium, here and there, somewhat swollen, but adventitial and perivascular infiltration was practically absent both there and in the meninges covering the cerebellum.

*Differential Diagnosis.* While in the literature the clinical phenomena have been confused with botulism, there is no justification for such association, for the two conditions have nothing in common except the occurrence of cranial nerve palsies. It is unnecessary, therefore, further to consider the matter here.\*

The nearest analogue to this disease, from a pathological if not strictly from a clinical point of view, is anterior poliomyelitis superior. Encephalitis lethargica appears almost exclusively in the spring. Its maximum incidence is in middle life. Its maximum mortality is in adult life. It is characterized at its earliest onset by gradually increasing stupor, without signs of meningeal irritation, or when this early apathy is replaced by restlessness, marked mental disturbance, especially in the emotional sphere, is present. Speech disturbance is an early and characteristic feature of the affection. It is not associated with flaccid paralysis of limbs or of body muscles, even when evidence of involvement of bulbar nuclei has appeared. The cranial nerve palsies appear gradually, slowly reaching their maximum, even receding at times completely before that maximum is reached, to recur later on, or to appear in some other cranial nerve, not previously affected. The palsy shows a tendency to involve the cranial nerves in pairs, both motor oculi or both facials, although not always simultaneously. The palsy is often incomplete and shows an almost uniform tendency to gradual recovery, although the latter may be slow. Residual permanent paralysis is rarely a feature of the disease. Anterior poliomyelitis is epidemic in the late summer and fall, although sporadic cases may occur at any time. Its maximum incidence lies in the first two years of life. Its maximum mortality is in childhood. The paralysis is prone to appear with little or no impairment of the sensorium, and when such impairment does appear, as it not infrequently does in the bulbar type, it develops relatively quickly and often with distinct evidence of meningeal involvement. When the latter does not appear

\* The reader is referred to the author's paper on "The Neurological Aspects of Food Poisoning," *Boston Medical and Surgical Journal*, Vol. CLXXXI, No. 12, pp. 413-422, March 22, 1917.

the period of sensorial impairment is not only relatively sudden but usually brief as well, not progressively more and more marked, as in the disease we are considering. The paralysis appears suddenly and usually reaches its maximum degree in a few hours, if not immediately. The cranial nerve palsy when it occurs is usually associated with coincident flaccid paralysis in some one or more muscle-groups of the extremities or body. Disturbance of speech is absent. Residual permanent paralysis is almost invariably present. It is very probable that further study of the cerebrospinal fluid may reveal characteristics that will also aid in differentiating the two diseases, but our knowledge at present is very imperfect concerning the nature of the specific character, if any, of the fluid in encephalitis lethargica. A lymphocytosis in the fluid may occur in this disease but it is more often absent or but slightly marked, compared with that seen usually in poliomyelitis.

In the writer's opinion, much more difficulty will be experienced in differentiating the affection from tuberculous meningitis. There is close similarity in the clinical features of the two diseases. Indeed, even with the help of spinal puncture, it may be impossible, and only a post mortem may be capable of deciding the doubt. I have records of instances of tuberculous meningitis that in onset and course resemble this disease. About a third of the cases in which a spinal fluid examination has been made have shown a well marked lymphocytosis and two revealed a marked excess of globulin. These two factors therefore are of no assistance in differentiation. Of course the discovery of tubercle bacilli would settle the question. The difficulty would occur, however, only in the exceptional case of tuberculous meningitis, for in the average case the meningeal phenomena soon become so conspicuous that suspicion would naturally turn towards this disease. In the early stage of the process, in a certain number of instances, however, the meningeal phenomena may not be evident. Most instances of tuberculous meningitis terminate within three weeks of the onset of the clinical signs, but so also do a few of the instances of this form of encephalitis.

*Treatment.* No therapeutic measures are yet known to be of any value in influencing the course of the disease. The treatment consists only in meeting temporarily such special de-

mands in the way of hygiene, diet, and nursing as the exigencies of the case call for. Retention of urine should be particularly kept in mind, also the danger of decubitus, and pulmonary complications.

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 (Showing relation of lesions to sopor and third nerve palsy.)

## TYPES OF SYPHILITIC DISEASE TREATED AT A PUBLIC CLINIC.

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WHILE it is possible further to tighten the strands in controlling the spread of syphilis, what is being done at the present time in combating the disease is laudatory, in that all cases being treated at clinics coöperating with the State Department of Health are given as thorough treatment as possible. The great factor in treating syphilis at these clinics, or anywhere where the means of proper treatment is at hand, is coöperation by the patient in coming for treatment, and carrying out instructions given. When a patient is told that in order to derive maximum benefit of treatment it is necessary to come to the clinic regularly, and obeys, invariably all goes well.

Recaitrant and neglectful patients are followed up and, in case of open lesions, forced to report for treatment. Cases not reportable are likewise communicated with, by letter or visitor, and advised to come for further treatment. If it can be impressed upon the patients that their coöperation is absolutely essential in order to treat their disease effectively, half the battle is won; otherwise it is a gamble—though it is surprising how many patients come to different clinics many years after receiving their infection, giving a history of indifferent or scant treatment, and presenting a negative Wassermann repeatedly. Compiling lumbar puncture

data on these cases ought to be of value in that many of them show cerebro-spinal involvement. It is far from the rule, however,—these rapid cures under the old vogue treatment,—and perhaps best explained by individual resistance to the disease and attenuation of the spirochaetal strain.

Where many hundreds of cases are treated during the year, all types of individuals, stages, and forms of the disease are encountered. And quite startling it is when the disease is met with in a person of apparent good health, and coming for treatment for a different ailment; the physician becomes hardened to the oftenness of the happening, but to the individual it is a different matter. Cases of this sort come under the hereditary forms of the disease, where the infection, through some factor or other, remains dormant, or where acquired syphilis manifested mild or fugitive symptoms in the early stages, or where the symptoms were ignored or missed by the physician.

The acquired form of syphilis is the predominant and formidable type—the one which the world has to grapple with, for if there were no acquired syphilis there would be no inherited syphilis. And it is the often insidiousness and vagueness of the disease that make the combat between medical science and syphilis more prolonged. It is not unreasonable to predict that eventually the spirochaete of syphilis will be handled as effectively as the typhoid bacillus—even allowing that syphilis is an entirely different type of disease pathologically than typhoid fever.

In the acquired form of the disease, the type that is the most agreeable to treat is the primary stage of the infection, because it is in these cases that the most prompt results of treatment are obtained. These cases usually appear at the clinic in the stage of full florescence, with accompanying inguinal adenitis—the lymphatic tide-gates battling against the ingress of the spirochaetes. Intensive treatment given at this time with arsphenamine and mercury more readily destroys the spirochaetes that have passed the lymphatic barriers into the general circulation, and subdues the otherwise unmolested migration of proliferating spirochaetes. The disease becomes nipped in the bud, and more readily controlled.

That arsphenamine has a destructive power against the spirochaete of syphilis has been experimentally substantiated, if we accept as evi-

dence the self-inoculation performed by Dr. Magian, chief of the French hospital at Manchester. Inoculating himself with a little serous fluid from a syphilitic chancre, he received in less than an hour an intravenous injection of .6 gm. of arsphenamine. No local or general symptoms followed, and the Wassermann test applied once a month remained constantly negative.\* If one has the good fortune to treat a patient presenting a dark field positive initial lesion before the blood becomes positive to the Wassermann test, it often remains negative. Hence the urgency of treating these cases as early as possible.

A number of discharged soldiers, contracting the disease through venery with diseased panderers, have come to the clinic for treatment during the period of demobilization, all manifesting fluorescent primary lesions, accompanied by positive Wassermann blood tests. Without exception, under intensive treatment with arsphenamine and mercury, they all showed negative Wassermann blood tests after receiving from six to ten intravenous injections of arsphenamine, two each week, and one intra-muscular injection of mercury salicylate a week. Being tractable young men, possessing an average degree of intelligence, they perhaps will faithfully continue their treatment until told they are cured. The primary stage of the disease is the most amenable to cure, and the older the infection becomes the longer it takes to cure. This sounds elementary but it does no harm to emphasize.

It is readily apparent that placing all cases of syphilis manifesting primary lesions—and in the period of secondary incubation—under effective treatment with arsphenamine and mercury markedly lessens the danger to the community, as the primary lesion rapidly melts away, and the general constitutional symptoms are usually forestalled. The bodily resistance doesn't suffer the handicap of combating a marked general invasion of spirochaetes, with accompanying toxemia and resulting cachexia, nor have proliferative changes taken place in the tissues, and the road to cure becomes smoother to travel.

The secondary erythematous and papular eruptions are usually amenable to treatment, rapidly fading away, as a rule, and the success in obtaining a negative Wassermann blood test depends upon the degree of tissue invasion, the

\* Bulletin de l'Académie de Médecine, Paris.

virulence of the infection, the accessibility of arsphenamine and mercury in reaching the spirochaetes, and the resistance of the individual. When the disease has progressed to present secondary symptoms, the cerebro-spinal system must be ruled Wassermann negative before one can be certain that a cure has been obtained, even though the individual has repeated negative Wassermann blood tests.

The early stage of secondary syphilis, in which the individual is of fair nutrition and of good habits, usually progresses to a clinical and serological cure when the patient coöperates in receiving treatment: lapsing for prolonged periods in this stage of the disease is like staking an entire fortune on the turn of a roulette wheel—possibly sacrificing a cure. The difficult types to cure are the ill-nourished, alcoholic, dissolute, or where the disease is firmly implanted in the tissues. But wonders are wrought with the poorest of human material, and the means of mercury, arsphenamine, and potassium iodide, judiciously given. And to these chronic secondary cases that finally succeed in obtaining a negative Wassermann, the victory of treatment—if it may be so termed, is to them what the sight of land is to a shipwrecked sailor.

Alcoholics, persisting in imbibing, thinking that it does them no harm, are advised to abstain absolutely, and are informed that if they persist they will cheat themselves out of a cure. Prohibition will prove an aid to the physician, and to the patient, in these cases. A large percentage of persistently active syphilides are found among those who have been persistent users of alcoholic liquors,—this disease indeed bearing testimony that alcoholic indulgence lowers vital resistance. It will be interesting to note the effect of prohibition upon the incidence of syphilis as time progresses.

Many a well-intentioned individual has contracted syphilis while indulging in a hurly-burly time with wine, women, and song; alcohol lowering inhibitory control, the joy emotions run rampant, and as an aftermath a primary lesion of syphilis appears. And many an innocent female has experienced the tragedy of the automobile, the cabaret, and the bawdy house, having succumbed to the charms and plans of an infected roné, that used alcohol as a means to gain the end. And so the demise of John Barleycorn will be a great help to the syphilologist in treating the alcoholic type of

patient, and indirectly lessen the incidence of syphilis in the community.

Accidental syphilis, innocently acquired, is a sorrowful thing, coming, as it does, without moral transgression, but from media which have been in contact with syphilides, or from the act of kissing those infected with the disease, where open lesions prevail. Quite often it is one of the family who has the disease and, having open lesions, contaminates whatever comes in contact with him. Such tragedies will become fewer as the strands become tightened in controlling the spread of the disease by reporting infectious cases and properly treating and sterilizing the infectivity of the open lesions.

The recidivist or relapsing type of patient is another contention clinics have to deal with: failing to coöperate in their treatment, the neglect is often followed by a return of manifest symptoms in the later stages; it then dawns upon many that it is not wise to be foolish. Another relapsing type presents where the individual had been formerly treated a number of years previous by a physician and told, after a more or less continuous course of treatment, that a cure had been attained. Many of these cases had been treated by capable physicians, and their judgment was no doubt based upon clinical evidence, physical findings, and empirical procedure: the present day instruments of precision were not then at hand.

The chronic, tertiary types of infection are present in large numbers, human evidence that many escape in receiving benefit of a thorough course of treatment, through some circumstance or other: it might have been their habits or neglect of treatment that hindered their cure, or insufficient treatment, lack of combating resistance or virulence of the disease. As the treatment of syphilis progresses such sequences will become fewer, through the more thorough treatment of the disease in the earlier stages.

The neurological types of syphilitic disease represents the end-journey of the spirochaete, and present the parietic, the tabetic, the epileptic, and those with combined, system, segmental, or focal degenerations; also the pre-degenerative or toxic types suffering from neurasthenia, headaches, spasms, neuralgia, and other irritative symptoms of syphilitic poisoning. They all receive their share of attention, and, like the age-worn ship that is made fit for service, all that is possible is done for them to ward off or delay the final day.

The hereditary form of syphilis presents itself at all ages and in all classes of society, though at charitable clinics it is the poor and middle classes that furnish the patients. The infantile type may manifest no symptoms, but brought to the clinic on account of one or both parents having the disease, the diagnosis is made by a positive Wassermann test. Then there are cases of apprehension where one or both parents having had the disease and received effective treatment, fear that the new-born, or other children may have inherited the disease; and the Wassermann test shows negative findings. Then there are family groups where one or more children will inherit the disease and others escape. Treating the expectant mother, suffering from syphilitic disease, is one of the most important responsibilities confronting the physician, either in public clinics or private practice, and such cases should properly be referred to a syphilologist, because active treatment with arsphenamine and mercury, guardedly given, markedly lessens the transmission of the disease from mother to child.

The possibility of hereditary transmission of syphilis often arises when an individual, having had syphilis before marriage, discovers while treating for some other ailment that his disease was not cured, notwithstanding the fact that he was told so. Then it is that the pangs of anguish dart through him, and he becomes possessed with a thousand fears. What of his wife!—his children! Are they also infected? He may suddenly become morose and suicidal; the world is a forlorn place to live in. It is here that the physician, by expending a degree of human interest and encouragement works wonders; it costs nothing, and often brings sunshine on many a cloudy day. And happy is the patient when he is told that wife and children have negative Wassermann tests.

The contrary often prevails when wife and children are found to have the disease; separation often occurs, and divorce proceedings are begun. A degree of diplomacy and tact on the physician's part can often calm the turbulence and upset emotions and the situation resolves itself into making the best of things. Again, a case of hereditary syphilis may be brought to the clinic for treatment; examination and a Wassermann test show the condition syphilitic; the mother is informed; she denies ever having the disease, but shows a positive Wassermann, the father is advised to come for examination;

he also gives a positive Wassermann blood test, and may present sign-marks of the disease. Usually one of the parents is able to recall a moral transgression, followed by symptoms.

Another type of infantile hereditary syphilis presents with manifest symptoms, and the physical and serological findings are dove-tailed into a parental history of syphilis; marasmus, malnutrition, fretfulness, snuffles, visceral lesions, dermatoses, or other symptoms, singly or grouped, are found on examination. Later on, the more advanced lesions appear, such as necrosis of the nasal bones, osteo-chondritis, paralysis, crow-foot scarring at the angles of the mouth, Hutchinson's teeth, disturbance of hearing, interstitial keratitis, dactylitis, and a train of other symptoms, appearing in early childhood, pubescence, or youth. Born with their heritage and handicap, the problem is to alleviate the symptoms as much as possible with the form of treatment indicated, and to re-juvenate and cure.

As the treatment of syphilis progresses, acquired and hereditary tragedies will become fewer as the disease becomes better understood, and means to check its spread are more universally adopted, for the itinerant carrier may be a danger to a distant community. The following points pertaining to the prevention, prophylaxis, and treatment of syphilis are of paramount importance in attempting to reduce the prevalence of the disease: reporting of primary and open lesions; venereal prophylaxis; syphilis-free marriage; educational propaganda—lectures, printed vehicles, and the cinema; following up the syphilitics lapsing in treatment; coöperation by the patient while under treatment; research work in syphilology; and educating the physician how to treat syphilis properly, including doing a Wassermann test in all doubtful cases of disease—for most any unresponsive condition might be caused by an obscure syphilitic infection. There is a mission to accomplish, regardless of prius and prudes.

#### THE SURGICAL RISK AND PREOPERATIVE TREATMENT.\*

By FRANK H. WASHBURN, M.D., HOLDEN, MASS.

THE operation is not all of surgery. Rather it is often a turning point or crisis in someone's disease history and led up to, or should

\* Read before the Wachusetts Medical Improvement Society, July 2, 1915.

be, by study of the symptom complex produced by the lesions present and of coincident conditions vitally affecting the individual's physical being. Perhaps it may be the outcome of a diagnosis resulting from painstaking work, extending over periods of possibly weeks or even months, of some physician, who only too often gets too little credit for a happy result, while the operating surgeon sometimes reaps the major praise. In passing, I wish to say it is the latter's duty to call attention, whenever it may become his privilege, to the worth of this medical service that due estimate of value may be placed upon the physician's work. If a surgeon points to a large series of cases of operation for, *e.g.*, acute appendicitis, without a fatal result, it may properly reflect some credit upon his work, but does it not speak for infinitely greater credit to the medical profession of his community whose members first make the diagnosis and whose prompt advice results in the saving of lives? That phase of the surgeon's duty we wish to discuss, however, has to do with his relation to the patient as a surgical risk.

If the time ever existed, it has long since passed, when surgeons were justified in operating without serious effort having been made to arrive at definite diagnoses of diseases under treatment and of conditions affecting individual risks, except in such cases as were acute exigencies. While exploratory procedures, at the present day, are occasionally legitimate or desirable and perhaps rarely imperative, with better knowledge of the living pathology, better instruments of diagnostic precision and improved clinical and laboratory methods, they should be less often resorted to. By this I do not mean that the female breast, *e.g.*, should not be radically amputated without absolute knowledge of whether its contained neoplasm is malignant or benign, nor that medical diagnostic acumen should be expected to be infallible. Operative surgery, however, is rather serious business and exploratory incision should not be undertaken merely because it is the easiest method of finding out the nature of an existing lesion; and while infallibility is a divine attribute, only earnest and painstaking effort may be the practice of any one of us.

The paramount preoperative consideration, then, is diagnosis, accurate as consistent with average medical ability. Team work is essential in diagnosis as well as in operative technique. Medical science is constantly broadening

and the demands on medical men are such that none can even approach a mastery of the whole. We should never hesitate to invite the aid and advice of those who have had special opportunity to acquire special knowledge, whenever required. The help of the neurologist, the oculist, the gastro-enterologist, the lung specialist or the syphilologist may be essential. Roentgenological examinations are requisite to accurate diagnosis in a large proportion of surgical diseases. While x-ray technique is ordinarily not beyond the ability of any who wish to take it up in connection with practice, certain studies should be in the hands of the expert technician and interpreter.

Accuracy in diagnosis is often possible only by means of laboratory aids. The *modus operandi* of some of the essential laboratory tests are too time consuming and too difficult for the average physician or surgeon, and the pathologist must be added to the team. When a fully equipped laboratory is unavailable, and expense is an obstacle, the State will make Wassermann tests, complement fixation tests, tissue examinations, etc. However, guinea-pig inoculations, blood counts, urinary examinations, the examination of stomach contents, feces, etc., may be satisfactorily done by anyone with enthusiasm and energy. The time-honored methods of physical examination, inspection, palpation, auscultation, etc., are still unsurpassed in importance. Careful history taking, too often slighted, is frequently the key to surgical diagnosis. Histories should be carefully recorded for subsequent study.

The diagnosis having been made by whomsoever it may have been, on the surgeon's conscience rests the responsibility of operation, and he should be satisfied with the diagnosis, if not with its completeness, with the indications, before procedure. He must either check up the diagnosis, if made by others, with his own knowledge or have a conscientious confidence in the team or individual who furnishes him the indications for procedure.

Second in importance to diagnosis, is estimation of the surgical risk. If the operation is one of necessity, while the knowledge of an impaired risk would not usually deter operation, it might influence the preparation, operative method, anesthesia, etc. For example, a high blood pressure or delayed blood coagulation time should cause one to be especially on his guard against hemorrhage; the presence of gly-

cosuria might influence a surgeon to choose gas-oxygen, or perhaps local anesthesia in preference to ether; or poor kidney function would indicate bladder drainage only, rather than complete prostatectomy at one sitting.

The whole body should be examined, noting skin and appendages, mouth, including teeth, gums, throat, etc.; lymphatic system, heart, blood vessels, lungs, abdomen, back, genitals, pelvis, and nerve reflexes.

General anesthesia should never be administered without a chemical examination of the urine, including tests for the acetone bodies. Microscopical examination may not be necessary except when indicated. Test for blood coagulation time and usually a hemoglobin estimate is called for. In some cases, Wassermann tests, white or red counts and differential counts are indicated, but a waste of energy would result from insistence upon these as routine. Blood examinations, however, are too often neglected or left to irresponsible persons. I believe the frequent expression made by some surgeons that they place but little reliance upon leucocyte counts has resulted from the hospital custom of leaving this rather important examination to the least experienced intern. White counts are by no means infallible guides, but in our experience are of great assistance both in diagnosis and in estimating the risk.

The risk having been found impaired, if the operation is an elective one, or to be done at an elective time, every effort should be made to improve the condition causing the impairment and the anesthesia and operative procedure should be modified consistently with type of deficiency in order that unnecessary morbidity and mortality may be averted.

There are some not uncommon post-operative calamities which occasionally might be avoided by preoperative treatment and they should be kept in mind. Among the more important are acidosis, anuria, hemorrhage, shock and collapse, bronchitis and pneumonia. Certain other post-operative calamities, as far as we know, cannot be influenced to any great extent, in our present state of knowledge, by preoperative treatment, such as thrombosis and embolism, sudden pulmonary edema, acute dilatation of the stomach and duodenum, paralytic ileus, etc.

*Acidosis.* Surgical traumatism, and especially general anesthesia, result in the formation of acid by-products, and an existing acetoneemia will invariably be increased by any known form of in-

halation anesthesia. The advice that "an ounce of prevention is worth a pound of cure" is truly apropos in considering post-operative acidosis. The acetone bodies have their origin in the metabolism of fat and it would seem that when the patient is in hand for a sufficient time that much can be done by diet. It is our custom, when possible, to prescribe, for several days immediately preceding operation, a fat-poor, low proteid, high carbohydrate diet. The ingestion of large quantities of water and aqueous fluids are urged up to the hour of operation and the fasting period is made as short as possible, merely of sufficient length to insure an empty stomach (except when preparing for operations on the upper intestinal tract). All the reliable methods that may prevent shock are indicated. It seems to us that the alkalis are better reserved for the treatment of actual existing post-operative acidosis, which, by the way, we have never seen, except in diabetic cases, when proper prophylactic measures had been taken.

*Anuria*, as a post-operative complication, must be exceedingly rare when the patient is possessed of two normally functioning kidneys. We believe this applies even to operations upon the urinary tract, or kidney itself. It is a frightful calamity, however, and not uncommon in cases where impaired kidney function exists. It behooves us, then, to use reasonable means to ascertain the functioning capacity of these important organs, and renal function tests are called for whenever there is the slightest reason to expect this inability. In all cases the emunctories ought to be stimulated and large amounts of fluids administered. When the "phthalein output" is low, if immediate operation is necessary, care should be exercised in the choice of the anesthetic.

*Hemorrhage*, both operative and post-operative, is always to be carefully considered in the preparation for every operation. The history may or may not warn us of hemophilia. Too often it does not. Jaundice, high blood pressure, delayed coagulation time, and anemia, are all warnings of possible hemorrhage. Material for all the approved methods of hemostasis and apparatus for transfusion should be at hand. Many drugs have been used with a view to increasing the coagulability of blood, but they are of doubtful utility. Thromboplastin, coagulose, chloride or lactophosphate of calcium, do-

fibrinated blood, human blood, etc., may be illegitimately tried.

The pre-operative measures against *shock and collapse*, beside those mentioned in considering the treatment of other mentioned calamities, are partly psychic and partly preparative for application during and immediately following operation. Suggestion plays an important part. Confidence in the whole team, pleasant surroundings, and the dispelling of fear should be aimed at. A preliminary dose of morphine, when not contraindicated, alone or in combination with other drugs, does much good. There is much that is practical in the methods of Crile, and gentleness of technique, at least, should be attempted if not his complete auto-association procedure.

*Bronchitis and Pneumonia.* Except when imperative, general anesthesia should not be administered during active respiratory disease. Bronchitis, whooping cough, slight colds, etc., are indications for delay.

The patient should be kept in a well ventilated room of even temperature and be sufficiently clothed. Care should be taken to avoid chilling the body while conveying to and from the operating room. The latter should be properly prepared by arranging the temperature to a degree above 70° F. The patient's mouth and throat should be carefully cleansed for a period prior to anesthesia and he should be placed in such a position on the operating table that he will not aspirate fluids during inspiration. Only clean, and preferably, sterile inhalers should be used in anesthesia. A skillful anesthetist is of great importance.

While to speak of post-operative care is to wander from my theme, I can hardly refrain here from mentioning my conviction that a trained person, either a physician or nurse, should watch every other patient to recovery. Among the many reasons for this is the susceptibility of the subject, at this stage, to chilling and to the aspiration of vomitus, etc., either of which may be factors in causing respiratory complications; even acute suffocation might occur.

While certain known physical defects may predispose to such complications as *sudden pulmonary edema, pulmonary embolism, gastric dilatation, ileus*, etc., except for the measures toward the improvement of those defects, when existing, there seems little one can do to pre-

vent these truly serious happenings. While they are rather infrequent, it is uncomfortable to feel that any one of this type of disaster may visit us after any clean, even elective, operation where one may have done his best work. This is indeed the proverbial "thunderbolt from the clear sky."

It has long been customary, and deemed important, to promote a thorough evacuation of intestinal contents before any operative procedure. This and post-operative catharsis has recently been considered by many surgeons unnecessary and by some worse than useless. To our mind this sudden change of view illustrates "the swinging of the pendulum" so often observed in changing medical opinion, and we feel that, while too much importance may have been placed upon catharsis, somewhere between the two extremes lies the correct procedure.

We shall not discuss the methods of preparation for a sepsis. Suffice it to say that it can hardly be too thorough.

Pre-operative treatment and judicious choice of the anesthetic has greatly reduced the hazard in operating in systemic diseases, some of which formerly furnished a high operative mortality. The diabetic frequently presents lesions demanding surgical relief and, while his glycosuria may be undesirable, we have learned that, rather than glycosuria, acetonemia is the condition most to be dreaded. Usually the diabetic can, by scientific dieting and other preparation, be made a reasonably fair risk for ordinary operations, and with appropriate technique primary healing may be confidently expected. Gas-oxygen seems to be the best general anesthetic in these cases. Joslin says, "If surgery is indicated, diabetes is no excuse for its non-performance." Again he says, "The more I see of diabetic surgery the less difference I observe in it from surgery of the non-diabetic."

The damaged heart, always a serious consideration, seldom contraindicates surgical measures which may be urgently desirable.

I am keenly conscious that I have covered my subject in a rudimentary and elementary manner, but the point I have endeavored to visualize is that the surgical operation is too serious a crisis, at least to the patient, to justify anything less than careful and serious prior consideration.



## Book Reviews.

*An Introduction to Neurology* (Second Edition, reset). By C. JUDSON HERRICK. W. B. Saunders Company, Philadelphia and London, 1918.

In the second edition of Mr. Herrick's presentation of this subject no change in the original plan of work has been made. Realizing that the understanding of the workings of the nervous system is a difficult problem, the information contained in this volume is considered strictly as introductory. The subject matter is divided into three groups: (1) Chapters I-VII discuss the more general neurological topics; (2) Chapters VIII-XVIII comprise a brief account of the form of the nervous system and the functional significance of its chief subdivisions in general, followed by a review of the architectural relations of the more important functional systems; (3) Chapters XIX to XXI are devoted to the cerebral cortex and its functions. Commencing with a biological introduction by way of foreword to the general subject, the several chapters on the nervous functions and systems comprise a clear, concise explanation of material necessary to the student of neurology. A list of references to general neurological literature, a carefully arranged general index and a brief glossary of commonly used technical terms, as well as a great many diagrammatic plates, facilitate the understanding of this subject.

*Handbook of Colloid-Chemistry*. By DR. WOLFGANG OSTWALD. Translated by Dr. Martin H. Fischer. Philadelphia: P. Blakiston's Son & Co., 1919.

In this second edition, the original translation of Ostwald's *Handbook of Colloid-Chemistry* has been revised and brought up to date. The author's individual views have been left unchanged; but some errors in quotations and in mathematical formulæ have been corrected, and there have been added sections presenting the important advances which have been made since 1912 in colloid-chemistry, particularly in the mechanical properties of colloids. The introduction presents the elements of qualitative colloid-chemistry analysis. Part I discusses the general constitution of colloid systems, the relations between the physical state and the general properties of colloid systems, the general energetics of the dispersoids, the distribution of the colloid state, and the concept of colloid chemistry. The second half of the book deals with special aspects of colloid-chemistry and explains the mechanical properties of colloid systems. Such problems as the relations of volume and

mass in colloid, their internal friction and surface tension, and the phenomenon of movement in colloid systems and its results are considered. This volume, translated from the third German edition, is an authoritative text, and is of value to the botanist and zoölogist, the physiologist, pathologist, physician, and surgeon.

*Information for the Tuberculous*. By F. W. WITTICH, A.M., M.D. St. Louis: C. V. Mosby Company, 1918.

Patients who are struggling against tuberculosis will find in this volume, *Information for the Tuberculous*, suggestions and help of decided value. The author, himself infected with tuberculosis at one time, has earnestly desired to give to similar sufferers a word of encouragement and practical assistance by showing them how best to use their time and energy in fighting tuberculosis. He explains the anatomy and physiology of the normal lungs, describes the action of the tubercle bacillus and secondary organisms, and shows the processes of lung healing in a clear and comprehensive manner. The importance of rest, exercise, and proper diet are emphasized. The relative values of tuberculin and drugs, the question of surgery in cases of pulmonary tuberculosis, and the value of sanatorium treatment are carefully considered. Measures which the patient may take to control the cough, and precautions which he should observe both during treatment and after he has been cured are suggested in a straightforward and encouraging way. The author's purpose is to help tuberculous patients to help themselves, and they will undoubtedly be substantially benefited by the publication of this book.

*General Bacteriology* (Sixth Edition). By EDWARD D. JORDAN, PH.D. W. B. Saunders Company, Philadelphia and London, 1918.

In this sixth edition the chapter on *The Pneumococcus* has been entirely rewritten and that on *The Meningococcus* has been extensively revised and several new sections have been added, including brief summaries of present-day knowledge of infectious jaundice, rat bite fever and trench fever. As an outgrowth of lectures to students, it has become a valuable textbook on general bacteriology but does not presume to fill the needs of the advanced worker. Many references are given throughout the text which may be used by those who desire to consult more extensive elaborations of particular subjects. One chapter is devoted to the fundamental methods and principles of laboratory work and in the thirty-seven chapters into

which the subject matter is divided, the methods of studying bacteria, the effects produced by bacterial growth, the classification of bacteria, the effect of physical and chemical agents upon bacteria as well as the characteristics and growth of many specific bacilli are discussed in a careful manner. The book is a good textbook and reference book for the general scientific student and is well illustrated throughout.

*The After Treatment of Wounds and Injuries.*

By R. C. ELMSLIE, M.S., F.R.C.S. Philadelphia: P. Blakiston's Son & Company. 1919.

In *The After Treatment of Wounds and Injuries*, the author has brought together in a systematic and well organized form the principles which two and one-half years of military experience in an orthopedic hospital have led him to believe are the most practical in the treatment of war injuries. The circumstances of war make the reparation of functional utility a difficult procedure, both because of the unusual severity of war wounds and the frequency of septic infection, and the additional physical and mental strain detrimental to early recovery. In this volume are explained the simplest and most expeditious methods applicable to the reparation of damaged parts, the replacement of lost function,—by tendon grafting, tendon fixation, and fixation of joints,—restoration by physiotherapy and the fitting of appliances. As chronic sinuses of bone occur very frequently and are of great significance in delaying reparative work, one chapter is devoted to the rational treatment of this condition. In the event of mal-union of fractures, the treatment of various types of displacement,—longitudinal, angular, axial,—must be considered from the point of view of restoration by simple osteotomy or reconstruction of the original fracture.

A discussion of damaged joints, the classification, prognosis, and treatment of stiff joints, the prevention and treatment of flail joints, and the pathology, clinical types, and the surgical treatment of nerve lesions, presents information of vital importance to surgeons. Injuries of the muscles, tendons, and skin involve the problems of restoring continuity in muscles and tendons, the transplanting of muscles or tendons, tendon fixation, and surgical appliances. The technique to be employed in this work, and also in splinting and in the use of plaster of Paris, is described and illustrated in a concise and practical way. Methods of treatment by baths, massage, passive movements, active movements and exercises, light and heat baths, ionization and diathermy, radium and x-rays should also be familiar to surgeons. Over one hundred and forty photographs and diagrams are helpful in illustrating the text. This book sets forth the methods and principles of orthopedic surgery found to be of most value under war conditions,

and should serve as an excellent guide to others in their practical work, whether civil or military.

*Mental Diseases.* By WALTER VOSE GULICK, M.D. St. Louis: C. V. Mosby Company. 1918.

The classification and diagnosis of mental diseases has been simplified by the publication of this volume, *Mental Diseases*. It presents the system adopted by the American Medico-Psychological Association in 1917, which has been accepted by the War Department and recommended for general adoption throughout the country. The different forms of psychoses are here included under twenty main heads: traumatic and senile psychoses, psychoses with cerebral arteriosclerosis, general paralysis, psychoses with Huntington's chorea, with brain tumor, or with other brain or nervous diseases, alcoholic psychoses, psychoses due to drugs and other exogenous toxins, psychoses with pellagra, and other somatic diseases, manic depressive psychoses, involution melancholia, dementia precox, paranoia conditions, psychoses with mental deficiency or with constitutional psychopathic inferiority, epileptic psychoses and undiagnosed psychoses. Other cases are classified according to mental deficiency, inebriety, or constitutional psychopathic states. In this book various types are considered with regard to the conditions peculiar to each; methods of examination are explained, and actual photographs illustrate the effects of mental diseases on different personalities.

*Clinical Microscopy and Chemistry.* By F. A. McJUNKIN, M.A., M.D. W. B. Saunders Company. Philadelphia and London. 1919.

The ground covered in this volume of 381 pages is mainly that of the routine laboratory technique employed in tests made in connection with every-day practice. The subject matter is arranged under five headings: Blood; Sputum, Serous Fluids and Exudates; Urine; Gastric Contents; Fees; and an additional chapter is entitled Histologic and Autopsy Technique. Under each of these headings methods employed in interpreting the significance of clinical findings are carefully explained. Especial emphasis is made by the author on the clinical application of these chemical and biologic methods. As a textbook, it is clear and comprehensive and as a reference book for those whose memories need occasional refreshing in technical procedure, it should prove very helpful. The chapter on the histologic work of a hospital laboratory as well as that on autopsy technique are a valuable addition to the main subject matter, and many helpful illustrations serve to further clarify the text.

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**MEDICAL FEES UNDER INDUSTRIAL ACCIDENT BOARD.**

THE medical profession of the Commonwealth will be interested in an article which has appeared recently in many papers, referring specifically to certain legislative recommendations of the Industrial Accident Board to the incoming Legislature. Among these alleged recommendations was one referring to medical and hospital treatment under the Workmen's Compensation Act and providing for the treatment and care of an injured employee for the full period of his incapacity at the expense of the insurer,—the insurer, however, to have the right to name a limited list of physicians from which the employee was to be required to make his choice.

This alleged recommendation of the incoming Legislature was one of a large number of recommendations made by the Industrial Accident Board last year to the Recess Committee on Workmen's Compensation, which sat through

the summer, and which finally reported to the Great General Court early in 1919. The recommendation was practically withdrawn by the Board, after hearing from the medical profession and conferring with representatives of the working population of the Commonwealth, all of whom were opposed to any amendment which would take from an employee his right to select his own physician.

It is a matter of record that the chairman of the Industrial Accident Board, after hearing labor's views upon the amendment providing for full medical treatment, without free choice, at the expense of the insurer, said: "This proposed amendment may now be regarded as a dead letter." Neither the Industrial Accident Board nor any other organization has since favored the amendment without reservations, nor has it been given serious consideration by the Recess Committee or the Legislature.

It appears that the press of the State, in the course of their publication of a statistical article prepared from the latest figures for publication, misunderstood the chapter relating to legislative recommendations and published them as if they were intended for the 1920 Legislature. It is not understood that the Industrial Accident Board has any intention of recommending any amendment which will deny to the employees of the State the privilege now enjoyed by them of selecting their own physicians to treat them when they are injured in their employment.

**BRISTOL COUNTY TUBERCULOSIS HOSPITAL.**

THE Bristol County Tuberculosis Hospital in Attleboro, which will be opened for the reception of patients in January, promises to be one of the best equipped hospitals in the State for the treatment of tubercular cases. The main buildings are already practically completed, the only work of importance still remaining to be done being the installation of modern hospital equipment and the grading of the spacious grounds. The property on which the institution has been constructed was formerly Talaquaga Park, including one hundred acres at the altitude of one hundred sixty feet. The administration building and hospital are ideally

located on a slight elevation, facing open country under cultivation, and skirted in the rear by woodland overlooking a pond. The cost of the institution is estimated at \$250,000.

Tuberculous patients from all communities in the county, with the exception of New Bedford and Fall River, each of which has a population exceeding fifty thousand, will be admitted to the hospital. The cities and towns in Bristol county, excepting New Bedford and Fall River, will each pay a proportionate share of the purchase price of the property, the cost of the buildings, and their maintenance. The buildings are of wood, thoroughly equipped with fire extinguishers. The hospital itself, which is a story and a half high, has been made fire-proof as far as possible, and is also sound-proof. The administration building is three stories high, having on the first floor administrative offices, a reception room, a large dining-room, and a kitchen which is equipped with a large steam table and mechanical dishwashers and dryers. The first floor is surrounded by a large veranda. On the second floor are the sleeping rooms, which will accommodate about fifteen nurses, and on the third floor are eight rooms for domestics. Each of the upper floors are surrounded by sun gardens, which patients will be permitted to enjoy.

In the rear of the administration building, and connected by a long corridor, is the hospital proper, which extends east and west about two hundred feet. In one wing there is a large ward for male patients, and the other provides accommodations for women and children. In the center of the building are two rooms for isolated cases. The building is so constructed that patients can be easily moved from the interior to the open-air sun platforms. As Dr. Adam S. MacKnight, who will be in charge of the institution, believes that attention should be given to psychology in the treatment of tuberculous patients, there will be reserved three rooms, containing four beds each, for patients whose characteristics differ from those of the other patients. Those with gloomy temperaments will be grouped together, to prevent demoralization, and jovial patients will find congenial companionship. In the basement of the hospital there will be four bowling alleys for the recreation of patients in stormy weather.

Patients who are able and desirous of working will be given employment and compensa-

tion. Fifty acres of land are under cultivation and will afford ample opportunity for men who wish to work in the fields. Patients with trades—carpenters, plumbers, steamfitters—will be given chances to work if they are in condition to do so. Women will be permitted to knit and busy themselves with such occupations as basketry, and will also receive compensation for their work.

The trustees of the Bristol County Tuberculosis Hospital are Richard W. Warner, chairman; Edward L. Crossman, treasurer, and Dr. MacKnight, secretary. Dr. MacKnight, who will reside at the institution and superintend its activities, was district examiner for the Rutland Sanatorium from 1903 to 1907, when he became state inspector of health, serving with the State Board of Health until 1918.

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#### ENFORCEMENT OF THE HARRISON NARCOTIC ACT.

THE attention of physicians is called to a pamphlet entitled "Enforcement of the Harrison Narcotic Law," which has been issued recently by the Commissioner of Internal Revenue. The recent decisions of the Supreme Court of the United States indicate the necessity for exercising the greatest care in carrying out the provisions of the Harrison Narcotic Law, as amended by the Revenue Act of 1918. It is important to know that it has been held unlawful for a physician to furnish a drug addict with narcotic drugs for the purpose of satisfying his appetite, and not in the course of regular professional practice of medicine and in the proper treatment of disease; a practitioner who issues an order under these circumstances, as well as the druggist who knowingly fills such an order, is judged to have committed an indictable offense. A physician must personally attend the addict and himself administer the dosage in order to show that he is practicing in good faith.

Physicians will undoubtedly be called upon to meet many cases which it will be difficult to solve in strict accordance with the Harrison Narcotic Act, for it is not to be expected that rules can be formulated to cover every specific case. In view of this fact, a number of suggestions have been set forth in this pamphlet which may be found of great practical value.

In extraordinary cases which cannot be decided by the collector, a full and accurate statement of the facts should be submitted to the Bureau at once. In many cases involving the treatment of incurable diseases, aged and infirm addicts, and the ordinary addict, the following suggestions, which are subject to modification through further interpretation of the courts, may be helpful.

In the treatment of persons suffering from a proven incurable disease, such as cancer and advanced tuberculosis, it is deemed justifiable for the reputable physician, strictly for legitimate medical purposes, to prescribe narcotic drugs for the immediate need of these patients, provided he personally attends such patients. The prescriptions in these cases should be endorsed by the attending physician to the effect that the drug is to be dispensed to his patient in the treatment of an incurable disease. The treatment of these persons should be conducted cautiously and not too much credence given to the statements of the addict, as an unscrupulous person will often try to impose upon the physician in order to secure drugs to satisfy his cravings. As no fixed rule can be laid down for the treatment of incurable diseases, the responsibility rests with the physician primarily, and also with the druggist who fills the prescription.

There are cases where aged and infirm persons who have been addicted to the use of drugs for many years may require a minimum amount of narcotics in order to sustain life. Prescriptions written to satisfy the needs of these patients may be filled without criminal violation of the law. The prescription in this case should be endorsed by the physician and the statement made that the patient is aged and infirm, and that the drug is needed to sustain life.

The chief difficulty in carrying out the Harrison Narcotic Act will be met in the case of the ordinary addict who is neither aged nor infirm nor suffering from an incurable disease. It should be borne in mind that mere addiction alone is not recognized as an incurable disease. It is a violation of the law for practitioners to furnish an addict with narcotics for the mere purpose of satisfying his cravings for the drug. There is being considered a project by which the United States Public Health Service will assist in the institutional care of these addicts,

but there has as yet been no specific appropriation made by Congress for this purpose. It is thought that it would not be difficult under the management of a reputable physician appointed by the local authorities, to examine, register, and give regular treatment to these ordinary addicts by reducing the dosage to a minimum and encouraging the addict to enter a hospital, sanitarium, or institution for further treatment and cure. It is the opinion of the Bureau that the so-called reductive ambulatory treatment, where narcotics are furnished to an addict who controls the dosage himself, will not benefit or cure the patient and will often lead to illicit traffic. All peddlers, smugglers, manufacturers, wholesalers, retailers, practitioners, and other persons who wilfully violate the intent and provisions of this law will be prosecuted by the field officers of the Bureau in order to eliminate this menace from the country.

#### MEDICAL NOTES.

A NEW GERM Foe OF MAN.—An investigation just completed by Surgeon Edward Francis of the U. S. Public Health Service adds another to the list of disease germs afflicting mankind. The germ, which bears the name of *bacterium tulareense*, was first isolated by Drs. McCoy and Chapin, of the U. S. Public Health Service, as the causative agent in a plague-like disease of rodents. It was not then known that the same germ also infects man.

Dr. Francis now finds that *bacterium tulareense* is the cause of "deer-fly fever," a disease occurring among the rural population of Utah and initiated (according to popular belief) by a fly bite on some exposed surface of the body. The site of the bite and the neighboring lymph glands become tender and inflamed, and they commonly suppurate. A fever, like that in ordinary blood poisoning, develops and lasts for three to six weeks. The patient becomes very sick and is confined to bed. The first case known to have ended fatally was reported in 1919.

Thus far something like two dozen cases of this disease have occurred in Millard County, Utah, in each of the years 1917, 1918, and 1919. Whether the disease prevails elsewhere is not yet known, but the announcement of the Public Health Service is expected to direct the attention of physicians to cases of this kind.

AMERICAN ELECTROTHERAPEUTIC ASSOCIATION.—The following physicians have been elected officers of the American Association of Electrotherapeutics and Radiology for the year 1919-1920:

President, William Martin, M.D., Atlantic City, N. J.; vice-presidents, Virgil C. Kinney, M.D., Wellsville, N. Y.; William T. Johnson, M.D., Philadelphia, Penn.; S. St. John Wright, M.D., Akron, Ohio; Mary Arnold Snow, M.D., New York, N. Y.; John H. Bureh, M.D., Syracuse, N. Y.; treasurer, Emil Heuel, M.D., New York, N. Y.; secretary and registrar, Byron Sprague Price, M.D., 17 East 38th St., New York, N. Y. Board of trustees: One year—J. Willard Travell, M.D., New York, N. Y.; Frederic deKraft, M.D., New York, N. Y.; two years—Frank B. Granger, M.D., Washington, D. C.; Frederick H. Morse, M.D., Boston, Mass.; three years—William L. Clark, M.D., Philadelphia, Penn.; Edward C. Titus, M.D., New York, N. Y.

ANTIRABIC TREATMENT AT THE PASTEUR INSTITUTE.—It has been reported in the *British Medical Journal* that during 1918, 1,805 cases underwent antirabic treatment at the Pasteur Institute in Paris. Among these there were five deaths, giving a mortality of 0.27 per cent. One of these five showed signs of hydrophobia during treatment, another failed to attend regularly, and the remaining three developed symptoms after the course of treatment. Cases are divided into three classes at the Institute: (1) those cases in which the biting animal is experimentally proved to have been rabid; (2) those in which the animal has been verified as rabid after veterinary examination; and (3) cases in which the animal is only suspected of rabies. Of the cases treated during 1918, only one of the fatal cases belonged to the last class. Eighteen cases were sent from England for treatment, none of whom developed hydrophobia. In the last thirty years, the total mortality among 32,817 cases treated has been 92, or 0.28 per cent.

USE OF SUGAR IN THE TREATMENT OF TUBERCULOSIS.—The use of sugar in the treatment of tuberculosis has been tried out in France, and the results obtained, reported in the December issue of *La Presse Médicale*, may be of interest to physicians in this country. The

article describes the effect of injections of saccharose, and points out the value of sugar as a remedial agent. It appears that sugars act in two ways on the secretions when injected below the skin: if the doses are light, they augment them; if heavy, they decrease them. It has been observed that the use of sugars resulted in a diminution of expectoration, perspiration, and other symptoms. Occasionally there is manifested an increase in fever, but this has been attributed to the new fields of the disease which the injections cannot prevent. The treatment is resisted by tuberculosis in the advanced stages, with active foci and grave intoxication; but when the acute phases are absent, even when there is considerable expectoration, night sweats, and marked weakness, the injections of saccharose have been found beneficial. It has been stated that this treatment is useless and even injurious if the doses are weak, and in every case it requires the careful administration of a competent physician.

YELLOW FEVER.—Major General William C. Gorgas has reported, after directing a campaign against yellow fever at Guayaquil, Ecuador, that he believes the outbreak to be successfully terminated in this last large center where yellow fever has been epidemic. It is to be expected that there will still occur a few cases in remote communities, but it is probable that these will not be of sufficient seriousness to call for another organized campaign against this disease. Although the results of General Gorgas' work cannot be fully learned until after the close of the rainy season, it is thought that the sanitary work which has been accomplished there will be sufficient to prevent reinfection.

ANTI-TUBERCULOSIS WORK.—The National Tuberculosis Association and the American Red Cross are coöperating in conducting the campaign against tuberculosis. The national organization already has five of its leading officers at work in a speaking tour which will cover all sections of the country, and more than one thousand local and state societies are assisting with all available resources of men, women, and money. In order to reach the children of the country, the National Education Association, which has a membership of four

hundred teachers, is carrying on a health crusade in the schools; eleven "health chores" are to be done each day for fifteen consecutive weeks, by the children, who will be rewarded by the titles of page, squire, or knight banneret, if their tasks are successfully completed.

In order to secure adequate financial support for the campaign, the American Red Cross has just put more than \$6,500,000 worth of Red Cross Christmas seals on sale for the coming season. The importance of this work may be realized upon consideration of the fact that during the past twelve months 150,000 Americans died of tuberculosis. Although the disease is both preventable and curable, we have not yet made satisfactory progress in its suppression. One way to promote the work is to buy American Red Cross seals, which bear the motto: "Merry Christmas: Health and a Happy New Year."

**A MINISTRY OF HEALTH IN THE UNITED STATES.**—There are now before the United States Congress two bills for the establishment of a national department of health. Under the provisions of the first, there is to be a Secretary of State, who is a member of the Cabinet, and a commissioner of health, both to be appointed by the President. The department is to include bureaus of sanitary research, vital statistics, child hygiene, food and drugs, quarantine, sanitary engineering, government hospitals, personnel and accounts, an advisory board of seven expert consultants, and an official conference of State and territorial health. Under this suggested arrangement, the existing Public Health Service, Bureau of Chemistry, and Division of Vital Statistics would be transferred from their respective departments.

The other bill makes similar provisions, with an appropriation of \$8,500,000 annually, \$850,000 to be used in coöperation with the States in establishing a uniform system of health administration, \$1,700,000 in coöperation with the States for sanitation, \$4,250,000 in the control of communicable disease, and \$1,700,000 for scientific research.

**VITAL STATISTICS OF NEW YORK CITY.**—The vital statistics of New York City for the year 1918 show that the death rate has been higher than that of 1917, a fact which may be explained in part by the influenza epidemic and the fact that two hundred thousand young men

in the most resistant age group have been absent in war service. Influenza was responsible for an increase in the mortality of every age group up to fifty years; in the old age groups, that of sixty-five to sixty-nine is the only one which has not shown a decrease. The fact that the two infant periods, under five years and under one year, have both shown increases may be charged partly to the effects of influenza and its allied respiratory diseases. In spite of its increase during the past year, New York still holds a low infant mortality record,—ninety-two per thousand births in 1918, compared with eighty-nine in 1917.

The 1918 mortality rates for typhoid, consumption, and cancer, organic heart and kidney disease, and diarrheal diseases among children under five all show a decrease over those of 1917. On the other hand, the children's diseases of measles, whooping cough, and diphtheria show slight increases. The mortality rates as a whole show that New York possesses an efficient health administration. Perhaps the two needs most clearly manifested by the vital statistic are a better knowledge of the maladies most common among children, and the education of households in matters of public health.

**NATIONAL RESEARCH COUNCIL.**—Dr. Henry A. Christian, Hersey Professor of the Theory and Practice of Physic at Harvard University, has accepted in Washington, for the academic year 1919-20, the position of Chairman of the Division of Medical Sciences of the National Research Council. Dr. Christian has been Physician-in-Chief of the Peter Bent Brigham Hospital, Boston, since 1911, and was Dean of the Faculty of Medicine in the Medical School of Harvard University from 1908 to 1912. He is a well-known and active member of various national associations of medical men and of the American Academy of Arts and Sciences.

**MEDICAL RESEARCH FOR BRUSSELS.**—A contribution has been made by New York society leaders to the King and Queen of Belgium for founding a medical research institute in Brussels similar to the Rockefeller Institute in this country.

**ELECTION OF DR. MURPHY TO YALE CORPORATION.**—Dr. Fred T. Murphy, a Detroit physi-

cian, has been elected a member of the Yale corporation, to succeed Dr. Parker of Hartford, who has resigned recently. Dr. Murphy was graduated from Yale in 1897. He was formerly on the staff of the Massachusetts General Hospital. At the present time he is chief of the medical and surgical sections of the Red Cross.

**RED CROSS BASE HOSPITALS.**—The base hospitals organized by the Red Cross for the Army and which were in use during the war, will be held intact for future emergencies, at the request of the War and Navy Department and as a part of the peace program of the American Red Cross. There are fifty of these base hospitals located at important points throughout the country.

**SACCHARIN AS A SUBSTITUTE FOR SUGAR.**—The bureau of chemistry of the Department of Agriculture has issued a warning to the public against the use of saccharin as a substitute for sugar during the present shortage. Dr. Carl I. Alsberg, chief of the bureau, is reported to have issued the following statement:

"The Department regards food to which saccharin has been added as adulterated, since a substance has been added which may render it deleterious to health. It also regards it as adulterated in that a substance of no food value whatever has been substituted for sugar, a very valuable food."

**DRUG PRICE CHANGES.**—The following report has been issued by the Drug and Chemical Markets: There have been many advances in the essential oil market, including oil of cloves, oil of bay, spike lavender, oil of cedarwood, oil of cubebs, and Italian orange oil. Wormseed and wormwood oils are very scarce. Safrol is difficult to locate in the local market. Bergamot and sandalwood oil are easier.

The call for phenol for export is increasing, but orders cannot be filled. Betanaphthol is under heavy inquiry, but shortage of stocks prevents spot business. Many extracts of dyewood are in limited supply, especially logwood, archil and hematine. Annatto, cochineal, and fustic are difficult to locate. Dextrines and starches are firm.

The harbor strike at New York has held up exports of vegetable and animal oils, and the foreign trade is temporarily dead. Soya bean

and cocoanut oils, which were active last week, were quiet and dull. Linseed oil for October delivery has declined ten cents a gallon. Lard oil was advanced five cents. Other changes were slight.

Quicksilver and mercurials are lower. Croscote carbonate, quinine sulphate, opium, and antipyrine are easier. Many crude drugs have advanced owing to scarcity, including elm bark and short buchu leaves. Price revisions were not numerous in the drug market. Business was active, and buyers are purchasing more freely.

Ammonium sulphate and ammonia water are extremely scarce, owing to the limited production of the by-product coke ovens. In spite of the handicap to trading caused by scarcity and the shipping difficulties due to the longshoremen's strike, a large volume of business was transacted this week in the heavy chemical market. Ammonium sulphuret is higher. Alums are firmer. Red arsenic is easier. Muriate lump is scarce. Caustic soda and soda ash are stronger. There is an acute shortage of sulphuric acid.

**TYPHUS IN POLAND.**—The International Red Cross has recently reported 124,000 cases of typhus in Poland, and has issued a warning to the western world. It is believed probable that the coming winter will witness one of the most severe epidemics that the world has ever seen. Doctors, nurses, hospitals, and medical supplies are greatly needed in order to secure the world's protection.

**MEDICAL STUDENTS IN SWITZERLAND.**—The *British Medical Journal* has published recently the following figures, summarizing the number of students in medicine in the five universities of Switzerland in the winter session of 1918-1919. The total number was 1,704. Bâle had 230, including 19 women, of whom three were foreign; of the male students 34 were foreigners. Berne had 390, including 30 women, of whom 15 were foreign; of the men, 125 were foreigners. Geneva had 317, including 62 women, of whom 47 were foreign; of the men, 112 were foreigners. Lucerne had 244, of whom 22 were women, eight of them foreign; of the men, 52 were foreigners. Zürich had 523, of whom 101 were women, eight of them foreign; of the men, 95 were foreigners.



**MEDICAL DEPARTMENT OF THE UNIVERSITY OF GEORGIA.**—The appropriation for the medical department of the State University of Georgia has been increased from \$30,000 to \$55,000. Of the new funds, the sum of \$20,000 is to be used in establishing a course in Public Health and Hygiene, and \$5,000 is to be added to the general income of the school.

**RESEARCH AND PRACTISE OF BIOCHEMISTRY.**—A legacy of \$60,000 has been made by the late Dr. Rizzi, physician in chief of the Ospedale Maggiore at Milan, for the purpose of founding an institute for research and practise of biochemistry.

**APPOINTMENT OF PROFESSOR L. BARD.**—Professor L. Bard has been appointed to the chair of clinical medicine at the University of Strasbourg. For twenty years he has held a similar position at the University of Geneva.

**HARVEY SOCIETY LECTURES.**—The first two of the series of the Harvey Society have been given at the New York Academy of Medicine. The first, "Biological Standards and Their Application to Medicine," was delivered by Lieutenant Colonel George Dreyer, M.D., professor of general pathology, Oxford University, on October 18. The second lecture, given on October 25 by Dr. H. H. Dale, of the Lister Institute of Preventive Medicine, London, was on the subject of "Shock."

**PROFESSIONAL ANNIVERSARY OF PROFESSOR G. ROMITI.**—The fiftieth professional anniversary of Professor G. Romiti, of the chair of anatomy, was recently celebrated by the University of Pisa. A marble portrait bust was unveiled, and Professor Romiti presented to the University his library on anatomy.

**ANATOMY DEPARTMENT OF JOHNS HOPKINS MEDICAL SCHOOL.**—The Department of Anatomy at the Johns Hopkins Medical School has been organized to include the following professors and instructors: Lewis H. Weed, professor of anatomy; Florence R. Sabin, professor of histology; George W. Corner, associate professor of anatomy; Charles C. Macklin, associate in anatomy; Robert S. Cunningham, associate in anatomy; Chester H. Heuser, associate in anat-

omy; Jean Firket, instructor in anatomy; William A. McIntosh, assistant in anatomy.

**MEDICAL SCHOLARSHIPS FOR NEGROES.**—Six scholarships of twelve hundred dollars each have been offered by Julius Rosenwald of Chicago for the use of negro graduates of American Medical schools for post-graduate work in pathology, bacteriology, physiology, pharmacology, or physiological chemistry. The following committee will award the appointments in 1920: Dr. William H. Welch, Johns Hopkins School of Public Health, chairman; Dr. David L. Edsall, dean of the Harvard Medical School, and Dr. Victor C. Vaughan, dean of the medical department, University of Michigan. Abraham Flexner, secretary of the General Education Board, will be secretary of the committee.

**ROCKEFELLER GIFT OF \$20,000,000.**—The sum of \$20,000,000 has been placed at the disposal of the General Education Board by John D. Rockefeller for the purpose of improving medical education in the United States. The income of this amount is to be used currently, and the entire principal to be distributed within fifty years. No plans have yet been made for its use, but it has been announced that it may be expected that substantial financial aid may be given to the five great medical centers of this country—New York, St. Louis, Baltimore, Chicago, and Boston. None of the money will be spent on educational propaganda, but will be expended directly and practically. Abraham Flexner, secretary of the board, is reported to have said that large sums will be used for the improvement of the hospital facilities, the teaching staffs, and the laboratory facilities of such schools as are decided to be worthy of help, and that a general survey of the schools of the country would be made in order that the needs of all parts of the United States could be considered in the distribution of the money. The gift came as a surprise, and is probably the first of its kind to be made.

**CONTROL OF VENEREAL DISEASES IN SPAIN.**—There has been established recently in Spain by royal decree a permanent board for the control of venereal diseases in that country. This board includes a number of the leading members of the medical profession in Spain and representatives of all classes. It has been reported in the *British Medical Journal* that Mar-

tin Salazar, director of public health, has stated that it is proposed to create institutions after the English model for prompt diagnosis and treatment. The board will study all the measures which will be proposed by the Spanish Anti-Venereal League, and will report progress in the control of diseases to the Government.

**BIRTH AND DEATH RATES IN EASTBOURNE.**—Another instance of the decreasing birth-rate in England is reported in the statistics of the Medical Officer of Health for the Borough of Eastbourne. During 1918 the birth-rate was considerably diminished and the death-rate was somewhat above the average. The war is not wholly responsible for the low birth-rate, for in the years preceding the war the number of children in the elementary schools was noticed to be decreasing yearly instead of increasing. It is hoped that adequate measures may be adopted for removing some of the obstacles to the successful bringing up of children and for checking the race suicide which is threatening England.

**HOSPITAL AT MONTDIDIER IN MEMORY OF AMERICANS.**—A municipal hospital is to be established at Montdidier in memory of the American soldiers who fell at Cantigny. It will be constructed from American Red Cross barracks, and will bear the following inscription over the entrance to the administration building: "Gift of the American Red Cross to the Town of Montdidier. In memory of the American Soldiers Who Fell at Cantigny."

**CARE OF FRENCH TUBERCULOUS SOLDIERS.**—The work which the French Government has undertaken in the care of tuberculous soldiers, in civil institutions, general military hospitals, and sanatoria, has been outlined in the *Revue Scientifique*. In 1916, in all departments committees were formed to whom were entrusted the care of all of the diseased soldiers. These committees are private associations, vested with some public authority, and are supported by private sources and some assistance from the State. The men are named to the committees, who furnish them as far as possible with prophylaxis, therapy, and social and family help. More than eight thousand men are thus cared for in the Department of the Seine alone. The work of these committees has

been so successful that numerous others have been formed which have greatly extended the original scope of the work. Over seventy dispensaries have been established, and eight sanatoria and nine departmental isolation hospitals have been erected from private subscriptions.

**MALARIA CONTROL IN CUBA.**—Cuba has organized a definite campaign against the malaria which continually threatens its tropical climate. Questionnaires have been sent to those in charge of the various sanitary districts so that actual conditions might be known; laboratories, some for diagnostic purposes and four for research work, have been equipped and utilized; and special districts presenting particular problems have been mapped out and assigned to special sanitarians. It is probable that after strict sanitary measures have been followed in Cuba for two years,—in cleaning up, removing the low weeds and shrubs, draining, petrolization, and screening,—there will result a marked improvement in the malarial statistics of that country.

**INTERALLIED CONFERENCE IN ROME.**—There was held in Rome in October (12th to 17th) the third interallied conference for the study of questions relating to war invalids. The following subjects were discussed: artificial apparatus for crippled men; physical and functional reëducation; help for the blind, deaf, and tuberculous; international legislation for war invalids, material and economic organizations, including benefit societies, coöperative production and similar topics, and pensions. There was also an exposition of prosthesis.

#### BOSTON AND MASSACHUSETTS.

**RELIEF AND CONTROL OF TUBERCULOSIS.**—At a meeting of the Executive Committee of the Boston Association for the Relief and Control of Tuberculosis held Wednesday, October 22, the Association decided to act as the agent of the National Tuberculosis Association for the sale of Red Cross Christmas Seals in the City of Boston, and appointed the following committee to supervise the sale: Arthur K. Stone, M.D., chairman; Vincent Y. Bowditch, M.D., and James J. Minot, M.D.

The number of seals the Association is expected to sell in Boston is 7,200,000 at one cent each.

Frank S. Mason has been engaged as Campaign Manager, and in order to sell this quota it will be necessary to wage a vigorous campaign. Seventy-two and one-half per cent. of the proceeds from the sale of the seals will be used for tuberculosis work by the Boston Association, the balance to be used by the Massachusetts Tuberculosis League and by the National Tuberculosis Association.

Physicians and others interested in suppressing tuberculosis are urgently asked to help sell these seals. Any who care to do this or to volunteer any portion of their time are urged to send their names to the office of the Boston Association for the Relief and Control of Tuberculosis, 3 Joy Street, Boston.

DR. W. J. COLLINS has returned to Northampton from France. Dr. Collins volunteered for service in June, 1917, as First Lieutenant and was ordered to Fort Benjamin Harrison for training; after extensive service, both in this country and with the Army in France, he attained the rank of Lieutenant-Colonel and was discharged October 21 at Camp Dix, N. J.

THE FOLLOWING FELLOWS have been recently discharged from the Medical Corps as Captains: Dr. A. N. Ball, who has resumed his former appointment at the State Hospital, Northampton; Drs. E. H. Hughes, B. F. Janes, C. T. Cobb, M. E. Cooney, H. G. Rockwell (Amherst), W. Hiltbold, and E. S. Winslow, (Easthampton), all of whom have returned to practice after varying terms of service in the United States and France; and E. E. Thomas, who was attached to the R. A. M. C. of the British Army in France and Belgium. Dr. Thomas has been elected secretary of the Hampshire District Medical Society in place of Dr. J. D. Collins, resigned.

DR. DANA FRANK CUMMINGS has removed from Cherryfield, Maine, to Natick, Mass.

CHILDREN'S PAVILION AT THE SHARON SANATORIUM.—The Children's Pavilion which has been added to the Sharon Sanatorium for Women affords an unusual opportunity for tuberculous children of the middle classes. Children of the very poor are cared for by the State sanatoria, and the wealthy are well protected; this Pavilion is intended for the children of people of moderate means who can-

not afford expensive places but who wish to have their children in healthful and pleasant surroundings. The advantages of the open-air school and constant medical care are great, and have gained excellent results during the first year. The Children's Pavilion promises to be an important factor in the control of tuberculosis.

MEDICAL SOCIAL WORK AT THE BOSTON CITY HOSPITAL.—The Boston City Hospital is in urgent need of medical social workers in the eye, ear, nose and throat clinics and for carrying on the work recently begun with the surgical children. An appeal has been issued also for additional funds with which to extend this service. A paid staff of sixteen, with a rising budget of \$20,000, imposes a heavy burden on the committee of earnest women who have made possible such service at the City Hospital. Contributions may be sent to the treasurer, William C. Endicott, 71 Ames Building.

APPOINTMENT OF DR. GOETSCH.—Dr. Emil Goetsch, formerly resident surgeon of the Peter Bent Brigham Hospital, Roxbury, Massachusetts, has been appointed head of the surgical department of Long Island College, New York. At the time of his appointment, Dr. Goetsch was associate professor of surgery at Johns Hopkins University. Dr. Goetsch is 37 years of age, and a graduate of the University of Chicago.

#### NEW ENGLAND NOTES.

ANTI-TUBERCULOSIS ASSOCIATION OF NEW HAMPSHIRE.—At a recent meeting of the Anti-Tuberculosis Association of New Hampshire an organization was formed for the purpose of raising \$100,000 for fighting tuberculosis in that State. W. R. Goodnow of Keene was elected chairman of the committee, and will establish his headquarters in Manchester.

SMALLPOX IN LAWRENCE.—One case of smallpox was reported to the Board of Health of Lawrence on October 20. The patient has been isolated and several people residing in a tenement block have been placed under quarantine. Three hundred employees of a local mill where one of the tenants in the house is employed will be vaccinated as a safeguard, as will be the employees also of a machine company at North Andover, where the son of the victim works.

**SCARLET FEVER IN WAKEFIELD.**—Fifteen cases of scarlet fever were reported in Wakefield recently. The primary department of the Greenwood School has been closed and the Union Church and the Catholic Mission have suspended services in order to aid in preventing the spread of the disease.

**RED CROSS APPOINTMENT FOR PROFESSOR WHIPPLE.**—It has been announced that Professor George C. Whipple of Harvard University has been appointed director of the division of sanitation in the bureau of hygiene of the International League of Red Cross Societies. Professor Whipple will continue his work at Harvard until February, when he will go to Geneva, the headquarters of the League.

**EFFORT TO STANDARDIZE MEDICAL EDUCATION.**—A conference was held recently in Boston by the faculty of the Boston University Medical School with officials of national organizations that are trying to standardize medical education. It is reported to have been proposed, by Dr. George Royal of Des Moines, Iowa, chairman of the Council of Medical Education of the American Institute of Homeopathy, and by Dr. G. M. Cushing of Chicago, a member of the Illinois board of registration, that in addition to the four-year college course, one year in a hospital be required of the student before he be given a license to practise medicine.

**WEEK'S DEATH RATE IN BOSTON.**—During the week ending October 25, 1919, the number of deaths reported was 175 against 436 last year, with a rate of 11.46 against 28.99 last year. There were 30 deaths under one year of age against 64 last year.

The number of cases of principal reportable diseases were: Diphtheria, 63; scarlet fever, 32; measles, 67; whooping cough, 13; typhoid fever, 1; tuberculosis, 59.

Included in the above were the following cases of non-residents: Diphtheria, 18; scarlet fever, 10; tuberculosis, 10.

Total deaths from these diseases were: Diphtheria, 3; typhoid fever 1; tuberculosis, 12.

Included in the above were the following non-residents: Diphtheria, 2; tuberculosis, 1.

Influenza cases, 6. Last year: Influenza cases, 304; influenza deaths, 174.

## Correspondence.

### AN APPEAL FOR HUMAN EMBRYOLOGICAL MATERIAL.

In 1906 I observed certain malformations of the human shoulder-blade, and, in contributions to current literature, I have given them the collective name—"the scaphoid type of scapula"—and have pointed out some of its hereditary, clinical, and anatomical significance.

Probably the most important observation connected with this type of scapula in man is its age incidence, that is to say, it occurs with great frequency among the young and with relative infrequency among the old. There appear to be two possible explanations of this fact: Either (a) one form of shoulder-blade changes into the other during development and growth; or (b) many of the possessors of the scaphoid type of scapula are the poorly adaptable, the peculiarly vulnerable, the unduly disease-susceptible—the inherently weakened of the race.

I have attempted to answer these questions by seeking evidence in various directions, and one of the most important of these has been a study of intra-uterine development of shoulder-blades. My investigations in this direction have been limited by the material at my disposal, which has been inadequate for a definite solution of this phase of the problem. I am, therefore, appealing to physicians for fetuses in any and all stages of human development.

It is desired that the material, as soon as possible after delivery, be immersed in 10% formalin in a sealed container, and be forwarded to my address, charges collect. Due acknowledgment will be made to those forwarding material.

WILLIAM W. GRAVES,  
727 Metropolitan Bldg.,  
St. Louis, Mo.

### SOCIETY NOTICE.

THE MASSACHUSETTS SOCIETY FOR MENTAL HYGIENE will hold a conference at Puckerman Hall, Worcester, Friday, November 14, at 4 P.M. The program is as follows:

Dr. Samuel B. Woodward presiding.

1. A State Program for the Care of the Feeble-Minded, by Dr. Walter E. Fernald, Superintendent, Massachusetts School for Feeble-Minded.

2. Mental Hygiene and the School, by Prof. W. H. Burnham, Clark University.

3. Gail or Dragon—Notes on the Prime Task of Humanity, by E. E. Southard, Director, Massachusetts State Psychiatric Institute.

The public is cordially invited.

### RECENT DEATHS.

DR. EDWARD BAILEY FRYE, a Fellow of the Massachusetts Medical Society, died at Boston, October 23, 1919, aged 63. He was born at Concord, N. H., October 20, 1856, was graduated from the Dartmouth Medical School in 1880, and settled in practice at Plaistow, N. H. He moved to Roxbury, Mass., in 1887, and later lived in Wellesley Hills. He had not been in practice since 1900. He is survived by his widow and four children.

DR. ROY CHURCHILL SKINNER, of Wellesley Hills, died at his home in Boston on October 10. Dr. Skinner was a prominent dentist, practising in Boston. He is survived by his widow, a son, and a brother.

# The Boston Medical and Surgical Journal

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## Original Articles.

### THE NECESSITY OF ADDITIONAL ACCOMMODATIONS FOR THE INSANE OF THE CITY OF BOSTON.

By JAMES V. MAY, M.D., BOSTON,  
*Superintendent, Boston State Hospital.*

THE provision of adequate and readily accessible accommodations for the insane of Boston is a problem which has required serious consideration on the part of the Commonwealth at frequent intervals for nearly one hundred years and one which, unfortunately, remains unsolved at the present time.

In 1829 the legislature appointed a committee "to examine and ascertain the practicability and expediency of erecting or procuring, at the expense of the Commonwealth, an asylum for the safe keeping of lunatics and persons furiously mad." This resulted eventually in the establishment of the State Lunatic Hospital at Worcester, which was opened for the reception of patients in 1833. In the first annual report of that institution the trustees called attention to the overcrowded condition of the wards and reported that it had been necessary to reject many applications for admission owing to lack of sufficient accommoda-

tions. An increase in the capacity of the building failed to relieve this condition.

The establishment of a hospital in South Boston was the next step in the solution of this important problem. The necessity of this action was very clearly shown by Dr. John S. Butler in the report of the Boston Lunatic Hospital for 1840:—"In the first annual report of this institution there appears a propriety in briefly alluding to the circumstances which led to its establishment, and to the means which it presents for the successful accomplishment of its objects. By an act of the Legislature passed in the year 1836, it was made imperative upon the several counties of the Commonwealth to provide suitable accommodations for those paupers within their limits who, being idiotic or incurably insane, were too unsafe, either to themselves or others, to be allowed to go at large, and who, on account of their condition and the crowded state of that institution, could not be received at the Lunatic Hospital at Worcester. The pauper lunatics of the City of Boston were at this time confined in the House of Industry and the House of Correction at South Boston. They were numerous, and many of them, especially those in the House of Industry, were, under the circumstances of restraint in which they were un-

avoidably placed, violent and dangerous. No special accommodations or attendance were allowed for them by the city government, and, though all which the circumstances of their situation allowed had been done for them, much remained to be done. In discharge therefore of the duties imposed upon it by the law of the Commonwealth and by the law of humanity, the government of the city with great unanimity voted to erect a hospital for the insane. The building, calculated to accommodate 100 patients, was commenced in 1837, and was ready for its intended inmates in the autumn of 1839."

At no time was this institution ever able to furnish sufficient accommodations for the insane of Boston. In 1853 the mayor of the city urged the erection of a new hospital as an immediate necessity. The opening of a hospital at Taunton in 1853 and one at Northampton in 1858 did not afford the necessary relief, although their wards were largely devoted to the care of Boston residents. In 1863 the Directors for the Public Institutions of Boston submitted a memorial to the city government calling attention to the need of a new hospital for the insane.

When the hospital at Danvers was opened in 1878, 49 Boston residents were at once transferred to that institution. This much needed assistance did not, however, lead to any marked improvement in the situation as far as Boston was concerned, as is shown by the following quotation from the report of the superintendent of the hospital in 1883:—"The hospital, like all others in the State, is full, and the pressure for admission continues, and will increase. The friends of those we are unable to accommodate are always urging us to take just one more. They cannot see why they should be discriminated against in the occasional admissions now possible here. And it is unjust that three-fourths of the city insane should be boarded in distant State hospitals, while the sick, the criminals, and the paupers are provided for nearer home. The insane, above all other classes, should be within easy reach of friends and home. It conduces to their contentment and happiness to feel that they are still residents of the city to which they belong, and not banished from familiar surroundings as well as from familiar faces. Their residence in hospital is often prolonged for years, and to be near home is the next best

thing to being at home. To be banished so far from home as to debar them from the frequent visits of relatives and friends is a hard lot indeed."

Within a year after the opening of the hospital at Danvers there were 612 Boston residents in the State institutions outside of the city. In 1889 this number had increased to over one thousand, and less than one-third of the insane of the city were being cared for at the Boston Lunatic Hospital. In 1898 there were 1401 Boston residents in public institutions for the insane, with only 519 in the Boston Insane Hospital. After removing the institution to Dorchester and developing a new hospital at a cost of \$859,900, the city was able to provide accommodations in 1900 for 496 of the 1669 insane of Boston. This condition prevailed until the care of the insane was assumed by the State.

The policy of the Commonwealth relative to the development of a hospital for the Metropolitan District was outlined in full in the report of the State Board of Insanity for 1908, from which the following extract is quoted: "The Metropolitan District has a population of some 1,200,000,—40 per cent. of the inhabitants of the State. It furnishes yearly 1,300 commitments,—46 per cent. of all. The whole number of insane under public care is 10,500. Hence, some 4,800 belong to this district. Its only provision is the Boston Insane Hospital, which furnishes 750 beds,—less than 15 per cent. of the insane resident in the Metropolitan District. Under present arrangements, 350 of its insane are committed yearly to the Boston Insane Hospital and nearly three times as many either to Taunton, thirty-five miles distant; Westborough, thirty-five miles; Danvers, twenty-two miles; or Worcester, forty-five miles. Needless hardship would seem to be imposed upon patients and their friends. Such neglect has resulted from the ineffectual attempt of the City of Boston to care for its own insane. As early as 1839 it erected the second public hospital for the insane in the State, and at the inauguration of State care and support of the dependent insane in 1904, it alone, at its own request, remained outside the provisions of the State care act, so far as its citizens have *legal settlements* in the city, less than one-half of the *residents* within its limits. Hence, at the most, less than one-half the problem relates to the city at the present



time, and, if the State's duty to the rest of the Metropolitan District be discharged, at least three-fourth of the whole problem now depends upon the Commonwealth for solution. While the city insisted upon exemption from State care, there may have been some excuse for the State's inaction; but now, when it seeks admission, the claims of the Metropolitan District assume paramount importance and press for immediate attention. A metropolitan institution for at least 2,000 patients should be established, according to the general scheme outlined. Its psychopathic hospital should be located in the city, convenient to committing magistrates and physicians and in association with the general hospitals and medical schools. Its original capacity should be about 120 beds, 60 for each sex, on a plan admitting of extension according to demand. It should receive all mental cases, *exclusive of alcoholics*, for first care and observation, preliminary to distribution to appropriate institutions. It should afford short treatment of a few weeks' to several months' duration to patients who may recover without transfer to other departments or institutions. It should be a center of scientific investigation into the nature, causes and treatment of insanity and of clinical instruction, in conformity to ideas previously expressed. There would be voluntary patients who should not come into such associations. Patients recovering from acute insanity need to pass out of an insane environment during the period of convalescence. Hence a voluntary and convalescent branch should be maintained, at a convenient distance from the reception hospital, to avoid these unfavorable influences and secure greater seclusion in pleasant grounds for open-air recreation. A fuller description of its essentials will be found in the preceding pages. Chronic patients should be transferred as soon as may be from the psychopathic hospital to the custodial and infirmary center or colony of the metropolitan institution, if they have interested relatives and friends in Boston or its vicinity; otherwise, to existing asylums. The custodial and infirmary center of the metropolitan institution should be within a ten-cent trolley ride of the State House, and in conjunction with the colony should provide for all the chronic insane whose friends desire their care within easy reach. Its colony should be within a twenty-five-cent trolley ride of the State House, located where

it would be possible to procure farming land sufficient for production of milk, vegetables, and other supplies for the table, and furnish outdoor occupation for patients. The psychopathic hospital, voluntary, custodial, and colony branches should be under one board of trustees and supervision of a general medical superintendent, who should have competent medical assistants in immediate charge of each. The pressure of public need of such an institution would be irresistible if the importunities of patients and friends against removal to distant asylums could be heard by legislators, as they are by trustees of Boston Insane Hospital and the State Board in appeals from adverse decisions."

This was an intelligent and well-defined policy which unfortunately has never been fully carried out. The State acquired the Boston Insane Hospital, which thus became the Boston State Hospital, in 1908. The Psychopathic Department was opened in 1912 in accordance with the plans of the State Board of Insanity as outlined above. The hospital in Dorchester has gradually been increased in capacity until it now has 1754 beds. A building to be opened early in 1920 will increase this to over 2000. A hospital of this size does not, however, meet the needs of the situation. It should be doubled in capacity. It would not then be able to care for the needs of the Boston residents now in the State hospitals, not to mention the requirements of the Metropolitan District.

During the six years ending January 31, 1918 (excluding the criminal insane) 6227 residents of the City of Boston were committed to State hospitals for the insane. Three thousand eight hundred and twenty-six, or 61.45 per cent., of these were committed to the Boston State Hospital, and 2401, or 38.55 per cent., were sent to other State institutions. This is shown in the following table:—

	BOSTON STATE HOSPITAL	OTHER STATE HOSPITALS	TOTAL
1913 .....	660	521	1181
1914 .....	684	421	1105
1915 .....	641	349	990
1916 .....	641	402	1043
1917 .....	583	407	990
1918 .....	617	301	918
TOTAL .....	3826	2401	6227
Percentage ..	61.45	38.55	100.00
Average per year ..	637.66	400.16	1037.80



During this period of time five residents of Boston were committed to the Northampton State Hospital, 103 to Grafton, 148 to Foxboro, 259 to Danvers, 384 to Taunton, 356 to Medfield, 480 to Westborough, and 666 to Worcester. Of the number committed to the Boston State Hospital it became necessary to transfer 497 to other hospitals owing to lack of accommodations. Including these transfers 2898, or 46.5 per cent., of the residents of the City of Boston committed to State hospitals during these six years were admitted to institutions outside of the city, owing to lack of accommodations at the Boston State Hospital. A census of Boston residents in the various State hospitals on January 1, 1919, shows 64 in Taunton, 76 in Danvers, 247 in Worcester, 222 in Westborough, 563 in Grafton, 748 in Medfield, 116 in Gardner, 166 at Tewksbury, and 119 at Foxboro,—a total of 2321. There were 1633 patients at the Boston State Hospital on this same date. Of the 3954 residents of Boston in State hospitals on that date, 58.7 per cent. were in other institutions owing to lack of room at Boston.

The capacity of the hospital in Dorchester should be increased as rapidly as possible. Buildings on that site will cost no more than they will at hospitals far removed from the Metropolitan District, where patients cannot be conveniently visited by friends or relatives. The site now occupied by the Boston State Hospital lends itself readily to the development of a large institution which would be adequate to the needs of the Boston district for all time. This is conclusively shown by a comprehensive plan for the projected development of the institution to its maximum capacity, as approved recently by the board of trustees of the hospital and submitted to the Commission on Mental Diseases. This scheme for the development of the institution is shown on another page. It provides for the erection of two additional groups of buildings, each with a capacity of 1200 patients, one additional building for patients in the West Group, two ward buildings in the East Group, an industrial building, a tuberculosis pavilion, a reception hospital, an administration building, etc. The estimated cost of this additional construction is approximately four million dollars. It would increase the capacity of the institution to at least 5600. In carrying out the development of the institution as projected, all due

consideration should, of course, be given to the availability of funds from time to time.

This additional space must be provided, either at the Boston State Hospital or at some other institution remote from the Metropolitan District. As these buildings are to house residents of Boston, there would seem to be little room for discussion as to where they should be erected.

The development of an institution with a capacity of five thousand patients should not be looked upon as an experiment in view of the fact that New York City now has an institution considerably larger than the one proposed, on a site almost exactly the same size as that of the Boston State Hospital. The successful operation of an institution is merely a matter of organization and administration, and we know now that a hospital of five or six thousand beds can be operated with exactly the same degree of efficiency as one with two thousand. Various objections have been offered to institutions of large size. The rapid increase in the insane population and the great outlay involved in building new institutions has, however, settled this question for all time, unless the Commonwealth is willing to assume a financial burden which will soon reach enormous proportions and lead to retrenchments which will inevitably result in an unfortunate lowering of standards.

The question of extensive farming operations on the present site of the Boston State Hospital should not be given serious consideration. Land worth from fifteen to twenty cents per square foot should not be used for that purpose. Several hundred acres for intensive farming should be acquired at some place not too far removed from the city, as recommended by the State Board of Insanity in 1908.

It has been suggested that another State hospital is needed in the Metropolitan District. This would mean not only a new site but a new water supply, a sewage system, transportation facilities, and the construction of a power house, storehouse, laundry, bakery, and other service buildings before any buildings accommodating patients should be utilized, even if they were completed and ready for occupancy. As these prerequisites already exist at the Boston State Hospital, there is no reason why they should be duplicated at some other place at an enormous expense to the State, which would only involve an unnecessary

outlay of money to no advantage. It would seem to be obvious that the additional accommodations which must be provided for the city can be made available at the Boston State Hospital at a smaller per capita cost than at a new hospital or at some existing institution remote from the Boston district. The fact that over fifty per cent. of the patients committed from Boston are transferred to other institutions only after a preliminary period of observation at the Psychopathic Department is a material reason why the insane hospital accommodations for the city should be within the limits of Greater Boston.

The possibility of providing facilities here for all the insane of the Metropolitan District should be given serious consideration at this time. Attention has already been called to the fact that about 46 per cent. of the insane of the entire State come from the immediate vicinity of Boston. Owing to lack of proper accommodations it has been impossible to commit them to the Boston State Hospital. The patients from Arlington, Chelsea, Nahant, and Revere have been sent to Danvers. Those from Belmont, Brookline, Cambridge, Newton, Watertown, and Somerville have had to go to Worcester. This is a hardship which has been unavoidable heretofore, but which should not be tolerated indefinitely, and can be remedied very easily by the development of the Boston State Hospital to the maximum capacity of the land already owned by the State in Dorchester.

## NEURO-PSYCHIATRY IN ARMY CAMPS.\*

By GEORGE E. McPHERSON, M.D., MEDFIELD, MASS.,  
Major, M.C., U.S.A.

At the beginning of the war there were said to be only two or three regular army officers who had given any special attention to neuro-psychiatry. The broad application of this specialty in the examination and care of soldiers was a comparatively new idea, its introduction being looked upon as an experiment. To have persuaded the powers-that-be that neuro-psychiatry should have an important place in the medical system of the Army, was in itself no slight achievement. To have placed over seven hundred especially trained men in the service and under the care of our section is deserving

of great commendation and, apparently, has proved of great value.

Whatever may have been its shortcomings, psychiatry, in the examination of soldiers, "made good" to so pronounced a degree as to warrant this branch of medicine a permanent position in the army medical equipment. At first inclined to scoff, the line officer soon became convinced that in the solution of many of his soldier-problems, his best friend and adviser was the psychiatrist. By the time the writer entered service a year ago, the high officials of the camps had apparently been won over to sensible procedures in the examination of those cases properly handled by our department.

Early drafts and volunteer enlistments which could not obtain satisfactory examinations supplied a large proportion of mental breakdowns and "misfits" constantly requiring attention until finally discharged. The number, for instance, of the mentally deficient which early went overseas loomed so large as the weeding-out process went on that the Commanding Officer of the A. E. F. cabled an order calling for more care in the selection of men and particularly for the rejection of such cases. At the commencement of activities, pressed along by the fear of shortage in man-power, many thousands of men were assigned to service which they were unable to perform, so that development battalions became cluttered with much material which later had to be discharged as unfit.

The belief that any man who had been able to perform a certain class of work in civil life could therefore render equivalent service in the army was shown to be based upon a misconception. Many men had done fairly well in the community only because they had not been called upon to adjust themselves to an unusually rigid environment with the forced restrictions such as obtain in the service. Under these latter conditions such men became mentally demoralized, upset the organization morale and caused worry and expense; beside often being under guard and before courts-martial when, in reason, they should have been quickly and permanently eliminated from the Army.

To those who had the fortunate experience of serving in the camps, there will be little that is new in this paper. It is written, however, with the expectation that those, whose other duties kept them out of the service, will be in-

\* Read at the Annual Meeting of the American Medico-Psychological Association at Philadelphia, June 8, 1919, and originally published in the *American Journal of Insanity*.

interested in a sketch of the practical work of psychiatrists in some of the cantonments. At the various cantonments, psychiatrists were to be found on duty in the camp proper and also at the Base Hospitals. Placed under one head, it was made possible to coördinate the performances of these two sets of workers and thereby to eliminate, via camp, a large number of cases who would, ordinarily and unnecessarily, have been sent to the hospitals for disposition. The grand old game of "passing the buck" was in full sway in the camps, so that, at one time, the hospitals were receiving nervous and mental cases who should not have been admitted, as they could have been disposed of in short order by the machinery for discharge already existing in the camp.

As a bit of administrative detail, we had it so arranged that, with the exception of a violent case or in a similar emergency, no soldier was sent to hospital unless previously he had been examined by a camp psychiatrist and recommended for such admission.

The importance of our work may be emphasized by submitting a few figures. During the months of May to September, 1918, inclusive, 54,000 recruits were examined at Camp Upton, N. Y. Of this number 1050, or 2%, were rejected for nervous and mental disorders. At Camp Gordon, in four months, July to October, inclusive, 58,850 men gave a rejection of 1225, or 2.8%, for similar diseases and conditions.

#### THE CONSCIENTIOUS OBJECTOR.

The conscientious objectors had loomed large as the worst problem in camp when the writer first assumed charge of the neuro-psychiatric work of the cantonment at Upton. Approximately nine hundred such men had been collected under special guard and segregated while awaiting the final disposition of their cases. A bad half-hour was spent in an interview with the commanding general, who demanded the proper solution, from our standpoint, of this problem, which was rapidly assuming alarming proportions.

Unlike the Quakers or the Mennonites, both of whom agreed to domestic service, the objectors at Camp Upton, who were largely of European birth, refused not only to do full military duty, but in many cases would not put on a uniform, do a stroke of work, or even sign the pay-roll. Such men had exasperated

the authorities and in time a number of the worst cases (that is, those with whom nothing could be done by persuasion) were sent to the Psychiatric Board for examination and report.

We were then confronted with the question as to the proper course to pursue. It had frequently happened that these flagrant cases had been excused from responsibility by a previous board on the basis of constitutional psychopathy which, in turn, accounted for the unflattering opinion of psychiatrists held by the Commanding General. There can be no doubt but that cases were deviates from normal, even psychopathic. These were men whose earning capacity and social status had never been even average. Many admitted belief in work simply because they were forced to earn an existence for themselves. Many appeared to be scholarly or, rather, to be great readers, especially of socialistic literature. Numbers of them appeared, moreover, to be strict vegetarians and expressed their repugnance of shedding of blood, even that of animals for food. No doubt they were "queer."

However, we had to report on their mental capacity and responsibility at a time when our country was facing the tremendous emergency of war. Such men, if released, would have become the rankest sort of propagandists. No civil institutions would have held them if they could have been committed, which seems unlikely. These objectors certainly knew it was wrong to commit murder, arson, or other crimes against law. Surely they knew it was wrong to break the laws of the country, and knowing such they could be held accountable for their misconduct.

Our final solution of this problem was this: The objector was classed as a constitutional psychopath only if facts warranted such a diagnosis, but he was held in the opinion of the Board "to have sufficient mental capacity to justify his being brought to trial" for refusal to obey military law. His conviction meant from ten to thirty years at Leavenworth which provided the only institution which could keep him from becoming a public menace. Such summary action by the courts did much to effectively change the attitude of the conscientious objectors as a class, especially after thirty of them were sent to Fort Leavenworth. Personally, from observation of their attitude toward confinement at the Base Hospital, I believe these men found in hospital or prison care better ex-

istences than many of them had ever known before.

#### THE DRUG ADDICT.

At Camp Upton drug addicts constituted 17% of the rejections for mental disease, while at Camp Gordon they made up 3.27% of such rejections. Many of these unfortunates pleaded to be accepted as they professed a desire to be cured of their habit and they thought the army life could bring this about. However, this scheme did not work, and it soon became evident that cures were, as a rule, out of the question: and, again, that all such men lowered the morale of organizations. Much evidence was obtained to prove the existence of an extensive business in the sale of drugs, not only to old habitués, but with the intent to increase the number of drug users.

After a fair trial of the idea that drug addicts could be made serviceable (which failed, by the way) all such addicts were rejected in all proven cases, as they were shown to be poor material for army purposes. There may have been a few cases of recently acquired habit who recovered completely but they were the exceptions. No recruit was discharged on his own say-so, but in positive cases corroborative evidence was not hard to obtain. Apparently the number of fake addicts was not large, very few trying to evade service by this device, although quite a number had not been at the habit long and were readily weaned from the drug. These last were not established cases and had none of the appearances of the old-timer.

A survey of one hundred drug addicts gave them a mental age rating of twelve years, which is not materially different from that of other soldiers of the same educational-industrial level. As a rule, they were, however, unskilled or poorly trained workers whose schooling, in fifty per cent. of the men, did not extend above the fifth grade. Only ten per cent. were foreign-born and the hundred was equally divided between two army drafts, one white, the other black. In both classes, the drug addict from a rural community seems to be a rare specimen.

Out of the hundred cases surveyed, fifty-six had been committed to penal institutions on charges other than drug addiction. Seventy-two men reported one hundred and seventy-three unsuccessful attempts at a cure. Although not measurably deficient, these men were certainly inferior in fields other than intellectual.

#### THE EPILEPTICS.

One would have supposed that such cases as epileptics would have been well weeded out by various draft boards with less difficulty than obtained in many other classes of registrants. However this may appear, large numbers of epileptics entered camps, later to be discharged when their disabilities came to our attention. Many men came to camp in the drafts with definite histories of seizures, showing scars on bodies and tongues, while some showed quite marked deterioration. Such were rejected, even on suspicion, some may say, but such a course seemed the common sense one. There was, of course, no defense against the epileptic who willfully deceived and who showed no evidence of his infirmity. One simply had to wait for his attacks, and fortunately they generally appeared quickly under the ardors of drill. Probably about 3.5% of 1050 rejections were because of this disease.

While possibly foreign to this paper, it is interesting to note that at Plattsburg men sent home from overseas as epileptics fell into one of three groups: the true epileptic; the hysterical; and the soldier who had "spells," "fainting spells," which appear to have been caused possibly by some endocrine disturbance.

#### MENTAL DEFICIENCY.

Thirty per cent. of our rejections for nervous and mental disabilities was for mental deficiency, about 0.6% of all cases examined. Such men offered a serious problem, as we had to overcome the disinclination of others to allow rejection of a man who looked healthy and strong. Orders from Washington instructed examiners to consider no man unfit for military service who should grade up to or over ten years, mental rating. One must also grade eight years or lower before he was to be considered unfit thereby for domestic duty.

It is my belief that no other class of men made for so much mischief in the Army as did the feeble-minded, and as has been said before, the stories of such soldiers as came to our especial attention proved the statement that ability to get along in civil life did not, of itself, insure satisfactory army service. Such an idea was not workable, and a large number of cases we had to examine were of just such soldiers who could not get along in a strange and exacting environment.

Psychological group examinations rendered an important service in calling to our attention men who graded low, and that earlier than without such ratings. All such were referred to the psychiatrist from the psychological boards, and in many cases were accompanied by a recommendation for rejection. More careful consideration of these men would find some fit for domestic duty, but, on the whole, the low raters did not prove "worth their salt."

The defects in fields other than intellectual were generally brought to notice when the higher grades of morons, for instance, failed to fit properly into their several assignments or organizations. Much that was reckoned as criminality or insubordination can be charged to the mental deficiency of these soldiers.

#### THE PSYCHOTIC CASES.

In the case of the psychoses, we were limited in the camps of my acquaintance to relatively few varieties. Manic-depressive psychoses, were present in very small numbers, especially while the drafts were coming in. From our experience at U. S. G. H. No. 34, it is to be inferred that such manic-depressive cases developed in considerable numbers after November 11. Most of the insane in the camps fell into the schizophrenic group and were generally called dementia praecox. In practically all of such soldiers it was possible to obtain outside histories which, together with the patients' stories, appeared to indicate that the acute psychotic episodes were but other stages in conditions which had existed for some time, even if below the surface. After worry at home over the draft-to-come, many men seemed to just go to pieces once they reached camp.

The alcoholic psychoses, as one would expect, in a draft of men between 21 and 31, were not numerous. There were a few cases of chronic alcoholism, but astonishingly few. Acute alcoholic hallucinosis was found in but few men also. Outside of numerous men who had endeavored to accommodate themselves to too many farewell parties and who came to camp intoxicated and shaky, alcohol did not cause much concern in the examination of recruits.

Neuro-syphilis contributed many cases for rejection, taken in the aggregate. In one draft of 800, luetic cases amounted to 0.7% of men examined. As might be expected, cities seemed to furnish a much larger per cent. of luetic

disabilities than did the country. Men so infected appear to have broken down very suddenly overseas, so that at No. 34 we have seen numerous cases who presented an extremely rapid onset and course, returning to this country with well-marked paresis.

Experience in camps terminated a bit too early to speak of the toxic-infections psychoses, of which we saw little. It appears from observation of cases at Plattsburg and at Norfolk, that following measles, influenza, and other acute diseases there developed frequent acute psychoses, most of which seem to have been only temporary.

#### CONSTITUTIONAL PSYCHOPATHIC STATES.

Under this heading one may speak of a large group of men, many of whom were accepted for service only to become very unhappy and a source of great concern to everyone interested. At Camp Upton fifty were discharged during five months, while at Camp Gordon two hundred and ninety-nine were thrown out in four months. Emotional instability, inadequate personality, and sexual psychopathy provided the sub-divisions under which the majority of psychopathies were classified. These three classes just mentioned were found to consist of poor material to begin with and the demands of war did not help them in their adjustments. It is my belief that we should have been even less conservative in the rejection or discharge of persons so unequal to the demands of the Army as were this class.

#### THE PSYCHONEUROSES.

One can hardly describe the amazing story of this class of recruits and other men who had entered the service only to fall by the wayside when active duty was undertaken. It is difficult to believe the frequency with which men were turned down for inability to drill or to march. Enuresis, hysteria, neurasthenia, and stammering furnished a large quota of rejects and discharges. It was interesting to learn the frequency with which other forms of the psychoneuroses had previously been afflicted with enuresis. Needless to say such men were constantly referred to us for disposition.

#### PRISONERS.

My first experience with a court-martial convinced me that many prisoners, should they be

examined, would, in all probability, be found to be mentally irresponsible, as was the case herewith described. N. Y. Z., a southern negro, was referred to the Psychiatric Board with his history: He was under arrest and awaiting trial for the murder of a white man and woman, the crime being committed while the soldier was on guard duty. His passions having been aroused by his discovery of a little "party" in the woods on his post, he shot the man; and when, resisting his advances, the woman tried to get away, he killed her, also.

The crime was soon discovered and after an investigation this negro was placed under arrest and for some reason was taken to New York City for arraignment. At this hearing he confessed the deed and signed a written statement of confession. Returned to the camp, he was put in confinement and our Board was asked to examine him. The first step in our procedure was to have a mental rating, and one of our own men did the necessary testing, giving the negro a mental age of 8.0 years. In order to be officially precise, one of the Psychological Board was also asked to examine him, which was done within two days. At this time a rating of 7.8 years was returned, the prisoner being unable to profit by the previous test.

Upon talking with the prisoner, we found him to be illiterate, dull, and entirely devoid of any appreciation of his plight. He denied the truth of his confession, although it was in detail and could not have been made up by one unacquainted with the intimate facts of the case. This confession was made, he persisted, so that "he might be allowed to leave jail and rejoin his company." His description of the crime, however, was too accurate to have been given by any other than a principal or near witness. After considering all the facts of the case, we unanimously reported this soldier as "not possessed of sufficient mental capacity to justify his being brought to trial."

The court was convened: all members of our Board were called upon to testify and the majesty of military law was impressed upon us. The average line officer appears to think that a crime having been committed, someone must necessarily be punished, really an "eye for an eye" sort of prejudice. As long as this negro could tell the court he knew it was wrong to commit murder, in their opinion he must be a responsible party. In spite of our testimony, he was found guilty of murder, and sentenced

to be hanged. The finding of the court and this sentence was approved by the Commanding General of the camp. The reviewing authority at Washington, however, set aside the verdict and ordered the man sent to an insane hospital for life, as a dangerous person and irresponsible. The attitude of this court toward the Board was much more sympathetic after this conclusion of the affair became known.

Another instance occurred at Camp McClellan, when three men were arrested for impersonating officers and for other irregularities. It seems two prisoners in the guardhouse were released by a mess-sergeant, the three then proceeding to be real "wild men." Stealing officers' uniforms and money, they took a jitney away from its driver and started on a career of crime across two states, only to be arrested and brought back.

The leader and brains of the trio was a pronounced constitutional criminal with a bad record of robbery, forgery, and implication in a murder. The others were both mentally deficient, grading less than nine years, and their histories were full of asocial acts. One feeble-minded soldier had been in the service over five years and admitted that in all that time he had not, in the aggregate, been out of the guardhouse more than six months. Yet he had been a source of expense and worry all that time, when he should have been discharged long before.

My early observation of prisoners so impressed me that by arrangement with the camp psychologist every prisoner was given a psychological test as soon as possible after arrest. With the Judge Advocate we had an agreement by which each prisoner found to be defective mentally, was reported as such, freed from charges, and discharged from service without further delay. In this way we were able to select and discharge such cases early, with all its entailed saving, whereas before we had not passed upon many cases unless deficiency had been suspected by the officers handling them.

Finally, the service at the base hospitals deserves some comment. Here psychotic cases, prisoners, and suspected malingers, drug addicts, as well as organic diseases, were studied and disposed of according to necessity. Many soldiers were seen in consultation with members of other services and a surprisingly large number of psychiatric cases were culled from medi-

cal wards. This was particularly true of the mentally deficient.

As time went by the wards of the hospitals became filled with soldiers who could not be considered "not in line of duty" cases and who had to be cared for. Now the Bureau of War Risk Insurance is relieving the Army of such responsibilities in cases which have been in hospital in this country for four months.

It is to be expected that the necessity for neuropsychiatry has been sufficiently established during these last two years to insure the more careful selection of men for the service at all times. Certain it is that our recent experiences have opened new lines of psychiatric investigation and endeavor as well as emphasized the great need of more careful and thorough handling of similar problems in civil life.

### THE RELATION OF ORAL INFECTION TO SYSTEMIC DISEASE.

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It is becoming more generally conceded that oral infection may be the cause of rheumatic attacks or allied conditions. Enthusiasts in the past have explained these conditions as due to uric acid diathesis, auto-intoxication, trophoneurosis, internal secretions and anaphylaxis.

In the last few years much attention has been directed to the teeth as a cause of the many systemic disorders. Again it is generally recognized that when a person has one or more infectious diseases, one may influence the other occasionally to the apparent advantage of the patient, but more frequently to his disadvantage. In other words increased susceptibility to one organism may result from infection with another. This subject has been dealt with in the literature under such titles as mixed infection, metastatic infection, secondary infection and focal infection.

The need for exact diagnosis (in our search for the seat of infection) is generally admitted, but the hidden focus often baffles definite localization, and treatment, consequently, has been lacking in directness and efficiency. This paper is written from the angle obtained by the use of the x-ray. The field of the x-ray is constantly widening and its diagnostic value increasing as its technical perfection is increased and its findings assimilated and checked up.

Oral sepsis should include the various inflammatory conditions affecting the mouth and attended by manifest infection. Hunter believes that, in addition to the purely local influence exerted by septic processes involving the oral mucosa and gums, important secondary manifestations are not infrequent. Alveolar abscess, periostitis, suppurative inflammation of the antrum and nasal sinuses, tonsils, pharynx, and middle ear, may be secondary to lesions primary in the buccal mucosa. Local infection traveling by the lymphatics may implicate the submaxillary and anterior cervical lymph-nodes. Inflammations of the gastrointestinal mucosa may be caused by pyogenic organisms which are primarily colonized in the mouth. Hematogenous infection, manifested by pleurisy and other forms of serositis and even ulcerative endocarditis, may have a similar origin.

Nodine, states that those who have used the x-ray extensively, not spasmodically, and have had the courage to accept and act on its findings, have found that a large percentage—as high as 95 per cent.—of the teeth whose pulps have been devitalized and the attempt made to fill the canals have incomplete or no root-canal fillings: 75 to 80 per cent. of these teeth have apical abscesses or apical infections radiographically discernible.

Of the five per cent. of those teeth whose root-canal fillings do reach the apex, a large percentage will yield bacterial cultures.

Of the 15 to 25 per cent. of the teeth which do not radiographically show bone destruction at the apex, there are a number about the roots of which, owing to super-imposition of bone densities one upon the other, the radiograph will not reveal bone destruction, although the destruction may be there and the teeth which are infected contribute their quota of systemic infections. Focal infection from the ends of roots of devitalized teeth are among the most certain, frequent, and insidious under-miners of health that we know and for the following reasons:—

1. These infections may, and most frequently do, occur without giving rise to any local pain or discomfort.
2. Foci exist about the roots of teeth which have been supposedly well filled.
3. Systemic effects are produced so gradually that the person thus afflicted is not conscious of any departure of his health from the normal.
4. The presence of such foci of infection is

usually not revealed except by either accidental or intentional diagnosis with the x-ray.

5. Often those infections exist about the roots of septic teeth without giving any radiographic evidence of their presence or manifesting any local symptoms.

6. The effects of these local infections are produced remotely, both in time and place, from their origin that there is no apparent connection between the two.

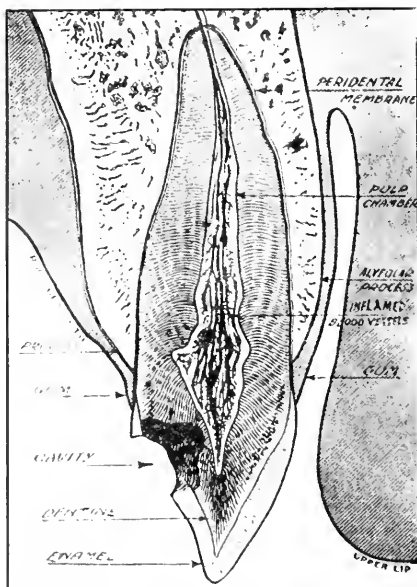


FIG. 1. Diagram. The anatomical relations of a tooth and the first state of apical osteitis, infection, and inflammation. (Diagram by courtesy of the Ransom & Randolph Co., from "Seven Stages of Decay.")

7. There is hardly a person over twenty-five years of age, who has had dental treatment in which the pulp has been involved, who has not one or more of these apical infections. The older the patient, and the more dental attention received in the form of crowns, bridge work, and the removal of devitalized pulps, the more foci of infection he may have.

8. These infections are the ones most puzzling to the oral surgeon and diagnostician, and the ones requiring his most skilful efforts to eradicate.

Oral foci may cause secondary infections via the capillary or lymph system. Absorption is

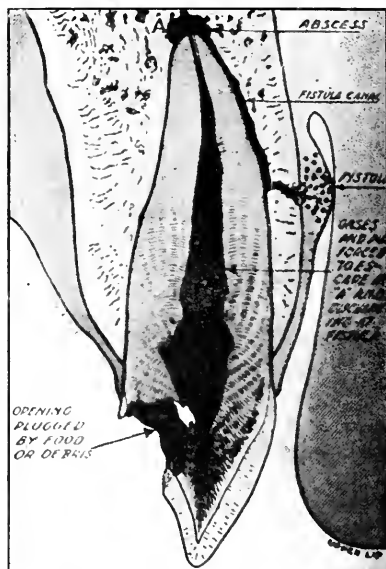


FIG. 2.—Diagram. The usual blind abscess (apical osteitis) has developed the less common fistula and gumboil. (Diagram by courtesy of the Ransom & Randolph Co.)

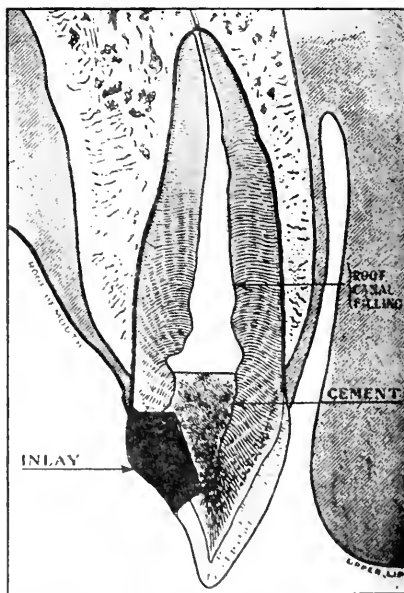


FIG. 3. Diagram. The root canal has been emptied of septic material; the osteitis, drained, has healed; and the canal, filled, is now aseptic. The root filling (white in diagram), more opaque than tooth, shows clearly in the radiograph. See Fig. 2. (Diagram by courtesy of the Ransom & Randolph Co.)





FIGS. 4, 5.—On left, root canal filled beyond apex with apical osteitis. On right, part of filling removed. Abscess cleared.

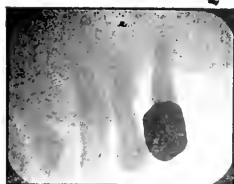


FIG. 6.—Crowned tooth. No root canal filling. Marked absorption about root. History of arthritis.

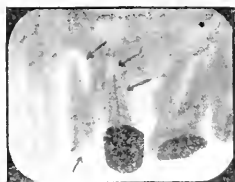


FIG. 7.—Crowned tooth. Absorption of apex of tooth and abscess formation. 2 Carious teeth. Abscess (osteitis) at apex. History of arthritis.

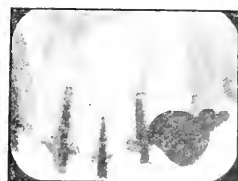


FIG. 8.—Large apical abscess (osteitis) following porcelain crown and cavity infection caused by failure to empty and fill root canal properly. Other teeth beginning to show same condition. History of arthritis.

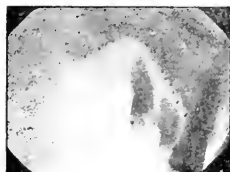


FIG. 9.—Marked absorption from neglected teeth. Another seat of infection.

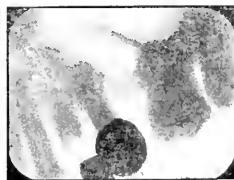


FIG. 10.—Crowned tooth and bridge. The dentist in this case did not take the trouble to extract the portion of the root in maxilla, which acts as a foreign body, causing abscess, with resultant systemic infection. Crowned tooth—root canal not filled.

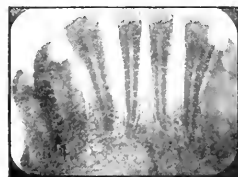


FIG. 11.—X-ray showing marked pyorrhea (Riggs' disease). History of arthritis. Note how the infection has extended to the apices.

most likely to be caused by blind, acute, or chronic abscesses, but occurs also from pyorrhea pockets, diseased gums and lesions of the mucous membrane.

Infection may also occur by pus discharging into the oral cavity, as in a pyorrhea, and suppurative gingivitis caused by poorly fitted crowns and bridges, and in alveolar abscesses with sinus; in the latter instance the result is mostly a local infection such as stomatitis, pharyngitis or an infection of the alimentary tract, as septic gastritis or appendicitis.

Oral abscesses, especially of the unsuspected chronic type, are in these days of overdentistried teeth a common infection and are of the

greatest importance in the diagnosis and treatment of the secondary disease. The unsuspecting and deceived individual is usually not aware of the menace which has undermined his health or is ready to cause the most terrible chronic diseases if the conditions for secondary infection are right.

A few years ago physicians gave little or no attention to the influence of teeth on their patients' health. Dentists up to within a few years looked upon the teeth simply as a part of the human machine, to be repaired, regulated, removed, or replaced, as the case might be, with little or no regard to their relation to the rest of the human organism.

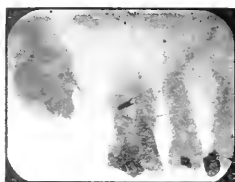


FIG. 12.—Man, 48. History of neuritis. Unerupted upper left last molar.



FIG. 13.—History of severe neuralgia on both sides of face. X-ray shows unerupted cuspid lying horizontally in lower jaws. Impaction.

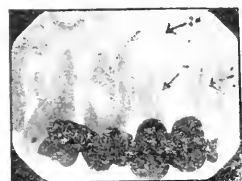
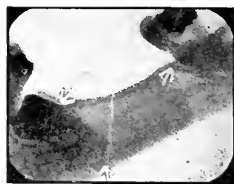


FIG. 14.—History of arthritis. Crowned teeth 1, 2. Root canals not filled: 1 shows absorption about apex; 2 shows abscess at apex. Periodontal infection along roots.

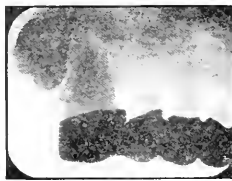


FIG. 15.—Unerupted upper left molar. History of neuritis.



FIG. 16.—History of arthritis. Stubs of teeth in jaw with abscess formation and absorption of alveolar process.

Within a few years a new conception of the importance of the teeth has arisen in the minds of both physicians and dentists, so that now some physicians when they cannot find, or before they have found, the cause of certain systemic and organic disturbances, look upon the teeth as the cause, and the dentist the instrument in removing the cause of these diseases. Yet there are other physicians who do not consider the teeth as having any material effect on the cause or the course of systemic diseases. There is still another class of physicians who look upon the teeth as one of the most important factors, direct and indirect, in the cause of certain systemic and organic diseases. They further believe that in consultation and coöperation with the dentist, and the employment of the x-ray, the local dental cause, if any, may be discovered and eliminated.

We read in the current literature (medical) about one patient with jaundice, fever and pain in the gall bladder region, also clinical manifestations of chronic appendicitis, cholecystitis, gastric and duodenal ulcer, chronic arthritis, etc., clear up rapidly after the extraction of diseased teeth. It is not to be inferred that the teeth are always the underlying factor in these condi-

tions but by eliminating the teeth as a source of infection, then our endeavors should be directed elsewhere as to its source, *i.e.*, tonsils, accessory sinuses, ethmoids, sphenoidal sinuses, and mastoids, middle ear, neck, mediastinum and gastrointestinal tract.

It has been demonstrated that gall-bladder infection is enough to keep a rheumatic condition active and progressive and that as soon as the cholecystectomy had been done the rheumatic condition cleared rapidly.

Today the teeth undoubtedly are the seat of more infection than any of the other foci of infection.

Black, of Chicago, after examination of 6,000 dental roentgenograms found that 75% of the people over 29 years have pathology about the roots of their teeth. These patients were from all walks of life, including 300 dental students, 50 Dental and Medical Reserve Corps Officers, and patients as they met on the streets.

With our present knowledge of focal infections as a cause of systemic diseases the high percentage of mouth conditions constitute a serious menace to the health and longevity of the people.

At one time the restoration to health of peo-

ple who had their teeth extracted and a set of false teeth made, it was claimed to be due to better mastication. However, today, we see a change in the health even before the false teeth have been obtained, and so the return to health must be due in great part to the removal of the infection. Only a short time ago I saw a case of acne of the face and shoulders clear up wonderfully after the extraction of abscessed teeth, the improvement having advanced even before the false teeth were obtained.

In the early days of dentistry teeth with diseased pulps were either neglected by the patient, or, if the treatment and relief of pain were sought, extracted. But when the value of the teeth for mastication became better understood, the dentist endeavored to save all possible teeth and many methods were found to treat pulpless teeth. It is not reasonable or possible to save every tooth, for many patients let their teeth get beyond this stage through carelessness or fear and the crown becomes carious, the dentine necrotic and the pulp dead, with the formation of one or more abscesses with the resultant pain and neuralgia, headaches, neuritis, eye-troubles, arthritis, and other systemic conditions.

Not until the x-rays were applied for the diagnosis in dentistry have we discovered the true condition of such teeth, and since the progressive dentist secures the services of a radiologist, or has an x-ray apparatus of his own, we stand before the grave fact that most pulpless teeth are the cause of chronic inflammatory processes in the alveolar process of the maxillary and mandibular bone, which give no trouble or only the slightest, local symptoms, but are the cause of much ill-health and disease.

In summing up, all mouth conditions should receive the most searching and scientific attention. It is of the greatest importance that there be established a clinical attitude which will insist that no treatment of these obscure diseases is complete without putting the teeth in order by dentistry that is beyond question.

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A SUGGESTION FOR THE IMPROVEMENT  
OF OBSTETRICS.

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AND

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In the autumn of 1917, during the emergency due to war-time conditions, there was appointed in Boston, under the Committee on Public Safety, a Sub-committee on Pre-natal Care and Obstetrics. In the report of this committee, presented soon after the signing of the armistice had removed the justification for its existence as an emergency wartime committee, there is noted a scheme for dealing with the problem of the obstetric poor. The method suggested is deemed more nearly adequate than any at present employed. The idea is not entirely new but its deliberate adoption on an extensive scale has not been put to the test of experience.

This scheme, serving as a stimulus to discussion in the committee, is here presented for wider discussion. The report reads (in part) as follows:

"It is evident that the problem of the obstetric poor, having an emergency aspect on account of wartime conditions, and heightened interest because of the loss of life from the war, is due to causes which antedate the outbreak of hostilities and which will continue to act after the signing of the treaty of peace. The Committee took the opportunity to consider the problem in its more permanent aspect and direct its thought toward seeking some solution of the difficulty. While it cannot claim to have found a solution, it believes a solution can be found and that active and free discussion will show the way. Therefore, it sets forth a scheme for discussion. The Committee is about equally divided for and against the scheme as a working plan, but the Committee agrees in regarding the aspect of child welfare within its particular scope as a branch of public health of fundamental importance which has as yet been neglected by the community interest. The Committee also agrees that the scheme as formulated will stimulate discussion, and therefore presents it in the hope that as a result of the discussion something better will be evolved.

"One of the most striking deficiencies in hospitals is the lack of adequate facilities for caring for women at the time of confinement. Ever

since it was realized that puerperal infection is wound infection, the opinion has gained ground that obstetrics essentially involves surgical risks and surgical procedures; but hospital facilities have not been increased for this as they have been for other surgical conditions. The first requirement, then, is adequate hospital facilities for all confinement cases which for any reason need hospital care. Every municipal hospital should have a well equipped obstetrical department.

"But most confinement cases, even among the poor, are cared for at home and can be cared for at home. The needs of these patients constitute the problem to be solved.

"How is care provided for women who can pay little or nothing? It is provided by the physician as a private individual or employed by the municipality or other governmental organization; by the midwife, official or unofficial; or by the charitable institution, public or private.

"It is in the charitable institution that we find conditions which are most nearly satisfactory, and in certain lying-in hospitals with outpatient clinics, the care of the patients leaves little to be desired. The system is well known. The patient presents herself at the clinic. She is examined carefully and thoroughly. She is visited at her home by the nurse who sees that everything needed at confinement is in the house. She visits the clinic for further examination and advice. When she falls into labor, word is sent to the hospital and her record is reviewed. Attendants from the hospital, usually two undergraduate medical students, go to her home, sometimes accompanied by a nurse. Reports are sent to the physician at the hospital, on printed forms covering all important points to be noted in the patient's condition. Preparations are made for delivery, and if labor is not progressing satisfactorily, the patient is seen at once by the resident physician. If necessary, the patient is transferred to the hospital, or a member of the visiting staff is called so that the patient gets adequate care throughout.

"The resident physician at the hospital knows the patient's condition and the progress of the labor through the frequent reports sent to him. He goes to her when he is needed and when he leaves she is in the hands of competent observers who can send for him again if necessary. Following the confinement at the home, there

are visits by the doctor, the medical students and the nurse until the patient is discharged. The results of this system are well known. It works well on the whole and in some institutions has given excellent results.

"There exists a serious difficulty in the way of indefinite extension of this system because there are not enough medical students in some cities and in cities without medical schools it cannot be used at all.

"The scheme proposed for discussion by the Committee is the substitution for the medical student of graduate and undergraduate nurses, preserving in other respects the system now in use in many hospitals.

"There would then be in a municipal or other hospital an obstetrical department as a center to which all cases needing hospital care could be sent. Pre-natal clinics would be established here and at sub-stations in the district if necessary. Patients at their homes would be cared for by physicians from the hospital who would be assisted by nurses as they are now assisted by medical students. If transportation were provided by automobile the number of cases seen and cared for would be greatly increased, for a given amount of effort.

"In a city of about 600,000 inhabitants with about 20,000 births annually, there would be approximately 5,000 cases in the group which would be cared for by such an institution. The total cost for doctors, nurses, ambulances, and supplies, including overhead charges and upkeep, would be less than \$20 per patient cared for at her home."

It is our purpose to open the discussion of this scheme by a consideration of some of the problems involved. We are not now concerned with the progress of obstetric science and art but with the applications, with the "distribution" of these "products." Assuming that obstetric science and art have reached the point at which adequate care becomes possible, the problem is: how can such care be provided during pregnancy and at confinement and during the puerperium at a cost within the means of those who can afford to pay nothing or almost nothing for such service? It is provided now for limited groups, by several means, of which the charitable institution only will be considered here, as it is the means indicated in the report.

Certain advantages of the proposed scheme may be noted.

1. It may be employed in communities in which no medical school exists. These are often the communities in which the need for adequate care is the greatest.

2. It will greatly increase the number of women who get adequate pre-natal and obstetrical care.

3. It will tend to improve the standards of obstetrical practice. Hospitals with obstetrical departments will become much more numerous. Physicians who are to be in charge of these departments will be selected because of their greater proficiency and by additional experience will make further progress. House officers will have more experience and better training and thus be better fitted when they enter independent practice.

4. It will greatly increase the supply of obstetrical nurses.

Some objections may be noted:

1. The propriety of sending a nurse to a confinement case at any time of the day or night, in a disreputable district may be questioned. This can be answered by a proper attention to details. Two nurses should always be sent on a case. In the circumstances mentioned they might be transported by automobile. In case of necessary telephoning, members of the family would always act as protection if a nurse had to leave the house for to reach a telephone.

2. The objection of incompetence on the part of the nurse must be met squarely. Women are, by their training, not as well fitted as men to deal with emergencies. Therefore, it is claimed, the patient is safer with the average medical student, who is a man, than with the average nurse, who is a woman. The objection emphasizes an important point in the system, which is that it takes the best method of preventing emergencies from the time the patient first comes to the clinic. Obstetrical emergencies are not frequent, as a matter of fact. Then, they are of two kinds; those which can be prevented and those which cannot be prevented. This system, by careful supervision, reduces the preventable emergencies to a minimum. In the presence of the unpreventable emergency, which is rare, the medical student and the nurse are equally helpless, and the trained obstetrician, without suitable material equipment is not much better off. The nurse would be as valuable as the medical student in calling for help.

3. It has been objected that this system trains midwives, which is against the general

sentiment in this country at present. The objection is based on a misunderstanding of what is attempted. The nurse is most certainly not a midwife; she is a part of the institution which carries the chief responsibility, and her duties and responsibilities are sharply defined and limited. She has little opportunity for the exercise of independent judgment. She is at all times under complete control. The midwife is an independent individual, licensed by the State, with far greater responsibility than the nurse and not under immediate control.

5. It may be objected that the nurse learns so much obstetrics that she may become a midwife. If this is legal, the remedy lies in amending the law. If it is not legal, in enforcing the law. But the objection that the system might teach the nurse too much obstetrics is not likely to have great weight with the physicians who do the work and have to depend on the nurse. There is now great opportunity for improvement in obstetric nursing.

6. The question of legality has been raised. This depends on the law, which varies in different states, and on the actual practice. At the present time, in certain states the care of women during confinement by medical students not under the direct supervision of a licensed physician, is practicing medicine without a license, and is therefore illegal. It would be just as illegal for a nurse under the same circumstances, but if a physician were always present, the requirement of the law, it is stated, would be met. If necessary, appropriate legal enactment could be made.

It is not necessary even to indicate all the evidence which points toward a needed change in the care of the obstetric poor. There is a rapidly growing interest in child welfare, and a realization that a considerable number of mothers and children do not receive adequate care, and the feeling is growing that something *must* be done about it. The waste to society from loss of life which ensues and is in considerable part preventable is tremendous. It costs too much. Another point of view is that under the present system many mothers and unborn children do not have a fair chance. It is not just.

Various solutions of the problem are presented, as for example, maternity insurance and the training of more midwives and the better training of physicians. But not one of these gets at the heart of the matter. The

only adequate solution is through an institution, not supported by the patients, whereby the community assumes a distinct civic responsibility. Invaluable as the privately endowed institution may be in certain respects, the community should feel its responsibility in the care of the obstetric poor.

One difficulty in the solution of the problem lies in the extreme range of service required. One case needs the most competent obstetrical care to secure anything approaching a favorable result; another is almost sufficient unto itself, and it is just this sufficiency in some cases that leads to the obstetric tragedies in others.

The fundamental requirements in any scheme are: (1) Skilled supervision throughout pregnancy, labor, and the puerperium. (2) A delivery service which is so flexible that the patient receives just the attention needed. In one case, a medical student, a nurse, a midwife, or a member of the family might safely supply that delivery service. In a sense, to employ a highly trained obstetrician would be inefficient. In another case, only the highly trained obstetrician can undertake the management. (3) The plan must include hospital facilities for some of the patients (approximately five per cent. of all cases), but preparation must be made to care for a large proportion of the cases in their homes where for various reasons the larger number of deliveries will occur. (4) Further, the plan must provide adequate nursing throughout; this can scarcely be emphasized too much.

The plan outlined in the report fulfils these requirements, providing skilled supervision, flexible delivery service, adequate nursing, at a reasonable cost.

## PRELIMINARY LIGATION IN HYPERTHYROIDISM.

BY FRANK H. LAHEY, M.D., BOSTON.

AFTER a personal experience with three hundred thyroid operations, it is my opinion that preliminary pole ligation is the one definite factor which can be said to make the final operation of partial thyroidectomy less hazardous.

The operation has logical indications, is based upon sound principles, produces definite effects, and consists of a clean-cut procedure.

*Indications.* It is not possible to specify in explicit terms the precise cases in which the operation is indicated, since decision as to the toxicity in a given case is not based upon exact percentages of tachycardia, increase in nervousness, or loss of weight, etc. I would only say that where there is even a suspicion that the patient cannot endure the complete operation of partial thyroidectomy, it should be preceded by preliminary ligation of the poles, at either one or two sittings. So convinced am I that preliminary ligation is a life-saving measure in hyper-thyroid cases, that I now submit to preliminary ligation many cases that I feel almost certain would endure the whole procedure at one sitting. This is done because I feel that there is a large group of hyperthyroids in the zone between those who can pass through the one-stage operation safely and those who quite obviously must be subjected to the two-stage procedure. By extending this zone farther into the group upon whom the one-stage operation would ordinarily be done, the risk of the operation can be diminished. Since ligation of one or more poles has been shown to produce such definite improvement, the extension of its application can effect nothing worse than a longer convalescence together with a safer operation,—an arrangement to which no sensible patient nor sound surgeon could object.

*Principles upon which the operation is based.* Pole ligation is based upon principles which are sound in so far as we understand the functioning of the thyroid gland.

In the first place, if the functional activity of the thyroid is controlled by sympathetic fibres,—as we may well assume after the experiments by Cannon, Binger, and Fitz, in which almost unmistakable signs of hyperthyroidism were produced in cats by anastomosing the vagus trunk into the superior cervical sympathetic ganglion—then ligation of the superior thyroid poles brings about an interruption of the impulses reaching the gland from the superior cervical sympathetic ganglion, as the branches from this ganglion reach the gland in company with the superior thyroid artery, and are ligated when those vessels are ligated.

If the activating material passes from the gland by way of its lymphatics, these also are blocked by pole ligation, as they, too, leave the gland by way of the superior poles along with the superior thyroid veins.

Last, and probably of greatest importance, something short of one-half of the blood supply of the gland is immediately cut off, a factor which should and probably does influence greatly the functional activity of its glandular structure.

Therefore, whatever view one may take as to the manner in which the thyroid functionates, the operation of pole ligation is bound to interrupt this process at least in some measure.

*Actual effects.* In my experience, the actual results obtained by this procedure are quite striking and remarkable. There has been consistently an immediate gain in weight, varying from a few pounds up to thirty pounds. This, according to my experience in all cases in which basal metabolism estimates have been made pre- and post-operatively, is in almost direct proportion to the lowering of metabolic activity. As one might expect, coincident with the diminution in hyperfunction, there is an improvement in the nervous condition, a lowering of pulse-rate, and a relative approach toward a normal condition. A further favorable factor is that the patients have become used to the hospital, have found that the ordeal is not of such magnitude as they expected, so that the second operation is met with greater complacency and fortitude.

*Time of waiting.* It has been my custom in double pole ligation to send the patients home for a period of eight weeks, during which time they remain reasonably quiet, but are not confined to bed or limited to sitting only, if their condition was such that they were able to get about before the ligation. A moderate amount of diversion and exercise is to be preferred to complete rest, I think, unless the toxicity is so intense that any activity is dangerous. If the condition permits the ligation of but one pole, the time chosen for the second ligation is influenced largely by the improvement in the patient's condition. In many very toxic cases, it is indeed remarkable to note that almost immediate improvement which follows the ligation of a single pole. As a rule, the second ligation may be done at some time within a period of from two to three weeks after the first ligation.

*Choice of operations.* Personally, I prefer ligation of the superior poles, because of the fact that the nerves, vessels and lymphatics may all be constricted by one ligature. It is but fair to state, however, that I have had but little experience with the ligation of the inferior thyroid artery outside of the sterno-

mastoid and on the inner border of the scalenus anticus. I have but twice ligated by this method, and while the operation is an excellently planned surgical procedure, and permits of very good exposure so that the inferior thyroid artery may be ligated as a trunk, it is not as satisfactory a procedure in my hands as the ligation of the superior thyroids. The ligation is at some distance from the gland, so that one cannot say with any certainty that entering lymphatics and nerves are included in the ligature as in ligation at the superior poles. Further, while careful dissection results in a good exposure of the trunk of the inferior thyroid, one cannot be guided by the top pole of the gland as in ligation of the superior pole, so that there may be doubt as to whether the proper vessel has been ligated or not.

*Disadvantages of pole ligation.* These comprise only the additional scars, and, at times, some added difficulty in freeing the superior poles during the partial thyroidectomy, on account of their being involved in the scar of the preliminary ligation. The additional time consumed in waiting can hardly be said to have been lost, as during this period there is a progressive improvement in condition.

*Technique.* The most important single step in the technique is the proper placing of the incision. Find the superior pole of the thyroid by palpation, and just above this make a short transverse incision about one and one-half inches in length. This is continued downward through the platysma to the sternohyoid and sternothyroid muscles, which may be separated or cut transversely. I have seen no ill results from cutting these muscles transversely, if it is necessary to obtain an adequate exposure of the superior pole. Much troublesome venous bleeding is encountered both in the skin, subcutaneous tissue, and muscles, but with patience it is easily controlled. At this stage, all vessels should be tied, so that the hemostats will not interfere with the exposure through the small opening. If the incision has been placed so that the outer border of the omohyoid is encountered, it may be retracted inward and the sternohyoid outward, thus exposing the vessels as they run into the superior pole of the gland. They are then surrounded by a ligature, care being taken to see that the posterior branch of the superior thyroid which runs down over the back of the gland is included in the ligature. After the ligature is applied, it is a good plan

to pull down the long ends of the ligature so that the vessels are lifted from their bed, and one can then be sure that all vessels are included in the ligature.

The operation may be conducted under local anesthesia, or local anesthesia preceded by scopolamine and morphine, or the combination of scopolamine, morphine, novocaine, and gas. It has been my custom to employ the latter procedure, because I have found it to result in the least amount of excitation on the part of the patient.

In conclusion, I wish to say that to surgeons experienced in thyroid surgery, the warning, "Ligate when in doubt," is unnecessary; they have either been aided by the procedure in maintaining a low mortality, or have been forced to it by a high mortality. To men experienced in general surgery, but not particularly in the surgery of hyperthyroidism, the warning, "ligate when in doubt," will prevent many a distressing table death, and but few surgical calamities are more harrowing than a death on the table while operating for hyperthyroidism. To the "now and then" operator, I would only say, if your conscience permits you to operate upon cases of hyperthyroidism, preliminary ligation is one of the ways in which the mortality rate in partial thyroidectomy for hyperthyroidism can be lowered.

### Book Review.

*The Humane Society of the Commonwealth of Massachusetts.* By M. A. DEWOLFE HOWE. Cambridge: The Riverside Press. 1918.

A historical review of the founding of the Humane Society and an account of its early interests, its growth, and its present activities is presented by Mr. Howe's book, "The Humane Society of the Commonwealth of Massachusetts." This benevolent society owes its origin to an English institution, the British Royal Humane Society which a number of citizens used as a model in establishing a similar society in Boston. The Society was organized in 1786. The chief object in the beginning was to restore cases of apparent deaths from drowning, suffocation, or other causes. The rules for the regulation of the Society laid down a form of government and a system of awarding premiums which had been used as a practicable working basis for the activities of the Society

since 1786. The first restorative measures adopted by the Society seem primitive enough in comparison with the methods employed at the present time. Bleeding was still an accepted practice, although it was restricted to members of the medical faculty; and the efficacy of "fumigators" was believed implicitly. However primitive their attempts may appear to modern minds, it is apparent that the founders of this institution were inspired by a confident idealism and a sense of responsibility which was characteristic of the whole nation during the period following the Revolution.

The thoughts and deeds of the members of the Society for the first thirty years of its existence were concentrated chiefly upon making provision for shipwrecked mariners. Life-saving stations were equipped at various points along the coast; the first lighthouse in America, Boston Light, was constructed; and houses were built and families settled on the Isle of Sables, where many sailors lost their lives every year. This book contains accounts of many rescues and resuscitations, which disclose the admirable spirit in which the early members of this Society carried out its purpose.

The Society soon began to enlarge its service beyond the limits which it originally assumed, and turned its attention to possible means of relieving human distress. Through the instigation of the Humane Society, the Boston Dispensary was founded in 1796. Another expression of its broadening interest was the vote of the Society to offer a premium of fifty dollars for communication of the most important and the greatest number of facts about the origin of yellow fever in the United States. In 1811, through the influence of the Society, the Massachusetts Legislature granted a charter for the establishment of the Massachusetts General Hospital; and during the next quarter of a century the Society contributed, at intervals, nearly ten thousand dollars. The McLean Asylum for the Insane and the Lying-In Hospital owe their origin to the funds of the Society and to the sentiment of its members.

The Humane Society has carried on its work of usefulness for over a century and a half. During this time, its interests have broadened and the means at its disposal have been increased. The early appropriation to hospitals has been followed in recent times by annual grants for their support. Through all the years of its existence, the Society has rendered generous service and has constantly increased its responsibilities. This volume, containing extracts from original documents and letters, gives an unusually interesting conception of its early ideals and promise; in its constant service to humanity, the Humane Society has supported the faith and purpose of its founders.



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## NUTRITION CLINICS FOR CHILDREN.

THE fact that a third of the children of preschool and school age in this country are underweight and undernourished, and have hitherto received little or no intelligent care, has led to the organization of a society, Nutrition Clinics for Delicate Children, for the purpose of investigating conditions among these handicapped individuals. In Boston, the movement is to be forwarded by a two-weeks' course on "How to Organize and Conduct Nutrition Clinics and Classes," to be given under the direction of William R. P. Emerson, M.D. This undertaking is a worthy one and will prepare students who have had some experience and training in nursing and social work to fill the need which exists for qualified persons in carrying on this branch of child conservation service.

The problem which confronts the Nutrition Clinics for Delicate Children is both a medical and an educational one, involving not only pro-

fessional supervision but also the coöperation of the home, the school, and the child. Nutrition clinics are to be established for the diagnosis of malnutrition and for the care and treatment of undeveloped children. This makes necessary the periodical weighing and measuring of all children in order to identify those who are seven per cent. or more underweight for their height, the providing of standardized basic physical examinations, and the care of defective children in the open air or at least in open-window classes with a reduction of school pressure during the period of treatment. It has been found that the presence of parents at the physical examinations and at the nutrition classes brings about more effective coöperation in the homes.

An article written by William R. P. Emerson, M.D., "Nutrition Clinics and Classes: Their Organization and Conduct," reprinted from the BOSTON MEDICAL AND SURGICAL JOURNAL, outlines the purpose and scope of this undertaking. Dr. Emerson states that the malnourished children compose about one-third of school children. They receive no special treatment; for as malnutrition is not considered a pathological condition, they are considered well by both private and school physicians. These children are forced through the various grades at a pressure greater than their under-developed constitutions can endure, with the result that twenty to forty per cent. of those graduating from elementary schools are physically unfit. The purpose of the nutrition clinics is to identify this group of children and to examine them carefully, from physical, mental, and social aspects, in order to make an accurate diagnosis of the causes of malnutrition. An average of more than five defects for each child has been revealed by physical examinations. The mental examination often discloses significant data about the child's disposition and reaction to his environment. The home life of the child is investigated by a forty-eight hour record of his food, hours of sleep, work, play, and time in the open air. Fast eating, insufficient food, the use of tea and coffee, late hours, closed windows at night, too little time in the open air, poor hygiene, over-pressure, and long school hours are often found to be the cause of the most severe types of malnutrition.

After the causes of the malnutrition have been found by means of these physical, mental, and social examinations, it remains to secure

the coöperation of the child, physician, teacher, and parent to remove them and give to the child the treatment suited to his needs. This can best be accomplished by the formation of nutrition classes of about twenty children. Each child is weighed every week, and his weight recorded on a chart. Diet lists are also kept, and suggestions made. Under the best conditions, a child should reach his normal standard of weight in ten or twelve weeks. Visits should be made to the homes to see that health habits are supervised by the parents. While in school, the children should have plenty of fresh air and adequate time for rest and luncheon periods. Experience has shown that children gain faster on less food taken in small amounts five times a day than when a larger amount of food is taken in three meals. Lunches containing about two hundred and fifty units should be served in the middle of the forenoon and afternoon. It is surprising to observe the interest exhibited by the child himself and the pride he takes in seeing his weight line go up and his stars of merit increase.

An experiment conducted under the auspices of the Bureau of Educational Experiments of New York shows interesting results. This undertaking has been described by Dr. Emerson in an article entitled "A Nutrition Clinic in a Public School." The experiment was conducted in New York Public School 64, situated in the crowded East Side, which was attended by about three thousand children. The importance of this work may be estimated when one considers that in one group of ninety-four children a total gain of 298.3 pounds was made.

The work which has already been done by nutrition clinics has proved that successful treatment in the majority of cases is not difficult and can be obtained with certainty, provided the necessary coöperation can be secured between the physician, nutrition worker, teacher, parents, and child. The organization of these clinics is an important step forward in the conservation of child life and efficiency, and should receive the commendation and support it well deserves.

## THE HOUSING PROBLEM IN GREAT BRITAIN.

ONE of the most important problems connected with the future welfare of any country is the housing problem. That this fact has

been recognized in Great Britain is evidenced by the efforts which have been made by Dr. A. Maxwell, medical officer of health of Edinburgh, Sir Arthur Newsholme, Sir Henry Tanner, and Mayo Tolman to arouse the people to an energetic reform of present conditions.

In a recent lecture before the Royal Institute of Public Health, Dr. Williamson called attention to the fact that certain districts in every city show excessive mortality. The conditions in these areas affect not only their own district, but also the municipality as a whole. It is significant that the last census issued in England and Scotland showed that more than half of the homes in the kingdom consist of either one or two rooms, one-eighth consisting of one room, and forty per cent. having two rooms. The following table shows the rooming congestion in eight Scotch cities:

CITY	NUMBER OF ROOMS				
	1	2	3	4	5+
Glasgow ...	13.8	48.7	21.2	7.2	9.1
Edinburgh ...	6.1	31.1	22.8	15.0	25.0
Dundee ...	9.9	53.1	21.6	6.4	8.9
Aberdeen ...	4.8	33.8	32.0	13.0	16.4
Paisley ...	11.9	53.0	20.8	6.3	7.8
Leith ...	5.3	44.5	26.0	11.0	12.9
Greenock ...	9.9	48.9	23.5	6.8	10.7
Perth ...	2.3	28.0	29.2	12.8	27.5

As a proof that there is a distinct relation between this congestion and mortality rates, Dr. Williamson has quoted the following tuberculosis figures for the one, two, three, and four-roomed houses: 5.3, 2.8, 2.2, and 1.4 per thousand inhabitants. As an example of what can be done to ameliorate these conditions, Dr. Williamson presents the following figures, which represent conditions in Stockbridge, where within a radius of nine hundred feet modern houses have been built to fit the needs of persons who could pay only low rentals, compared with St. Leonard's, a typical congested district:

	ST. LEONARD'S	STOCK-BRIDGE	WHOLE CITY
Population .....	20,856	4,886	754,534
Density per acre ..	351.8	82.8	16.4
Mortality, all			
Under 5 yrs. ....	60.8	15.0	42.9
Tuberculosis ...	2.2	0.8	1.6
Consumption ..	1.6	0.8	1.1
Zymotic .....	2.7	.....	1.5
Birth rate .....	23.7	13.3	17.8
Infantile mortality	179.7	61.5	132.0
Houses with 1 rm.	1,367	57	.....
with 2 rooms ..	1,352	145	.....

Sir Arthur Newsholme has also studied the housing problem, and in a recent address discussed the sanitary requirements necessary in maintaining a healthy family, and therefore national life. The house should be free from dampness, have sufficient floor space, its own water supply, a paved yard and street, and a movable dust-bin. Dr. Newsholme believes that matters of convenience and means of saving labor,—such as arrangements for heating water, less storage of food, and supply of hot water over the sink,—must be included in a satisfactory sanitary arrangement.

Sir Henry Tanner, at a meeting of the Royal Sanitary Institute, has discussed the cottage type of building for the city or large town. He believes that the bungalow type is more satisfactory than the two-story house because it saves labor and avoids the necessity of going up and down stairs. He has suggested that there be standardized patterns in concrete, as lumber for forms is more costly and more difficult to secure. For floorings, he advocates the use of linoleum laid on concrete, with tiling in the scullery. In order to solve the hot water problem, he suggests that a small boiler be installed in the kitchen, and that there be a fireplace with an oven and water heating pipes in the living room.

In speaking of undertaking a reform of the housing methods, Mayo Tolman, sanitary engineer of the West Virginia State Board of Health, has emphasized the necessity of basing reform on a sanitary and economic basis rather than on an aesthetic one. He points out that a municipality can save money through improved housing and a consequent minimizing of sickness and crime better than by economizing on dollars and cents. It would be well if we would all remember that communicable diseases have a better chance of spreading in congested districts, infant mortality is much higher in houses which cannot be kept clean, and tuberculosis accompanies deficient ventilation. It has been pointed out that rows of well-kept municipal dwellings are more to be desired than jails, institutions, and sanatoria

with a rate of 12.05 against 21.20 last year. There were 34 deaths under one year of age against 38 last year.

The number of cases of principal reportable diseases were: Diphtheria, 70; scarlet fever, 42; measles, 80; whooping cough, 16; typhoid fever, 4; tuberculosis, 49.

Included in the above were the following cases of non-residents: Diphtheria, 13; scarlet fever, 9; typhoid fever, 2; tuberculosis, 5.

Total deaths from these diseases were: Diphtheria, 4; typhoid fever, 2; tuberculosis, 16.

Included in the above were the following non-residents: Diphtheria, 1; typhoid fever, 1.

Influenza cases, 8. Last year: influenza cases, 200; deaths, 99.

ASSOCIATED IN MEDICAL PRACTICE.—Dr. George Arnold Rice has become associated in practice with Dr. Frank H. Washburn at Holden.

Dr. Rice graduated in 1916 at Tufts College Medical School and gave four months' service, in the summer of 1916, to the New York City Hospital and School for Feeble-Minded Children, at Randall's Island. He was intern at Rhode Island Hospital, receiving his certificate in 1918. During the war Dr. Rice was surgeon to the 186th Aero Squadron and was recently discharged with the rank of Captain.

THE HOUSEHOLD NURSING ASSOCIATION.—A training school for attendants is conducted by the Household Nursing Association at 544 Massachusetts avenue, Boston. The course extends over six months, the first two devoted to household work and cooking and the last four to work in various hospitals. The work of these attendants after the course is completed is followed up by trained nurses. The Association reports that excellent results have been obtained during the eighteen months of the school's existence, but that additional funds are urgently needed in order to carry on and extend the work. The services of attendants, and of a graduate nurse in maternity cases, may be obtained through this Association.

APPOINTMENTS AT HARVARD UNIVERSITY.—The following appointments have been announced in the psychological department of Harvard University:

Dr. Herbert S. Langfeld has been appointed director of the psychological laboratory; Dr. William McDougall has been made professor of

## MEDICAL NOTES.

BOSTON AND MASSACHUSETTS

WEEK'S DEATH RATE IN BOSTON.—During the week ending November 1, 1919, the number of deaths reported was 184 against 319 last year.

psychology, and will begin his work at the commencement of the next academic year: Dr. L. T. Troland and Dr. Floyd Allport have been appointed instructors in psychology.

**GIFT TO SHARON SANATORIUM.**—In the recent will of Arthur F. Estabrook, a bequest is made to the Sharon Sanatorium of \$5,000, payable after the death of his widow.

**HARVARD MEDICAL SCHOOL LECTURES.**—A series of lectures under the general topic, "The Physician as a Leader in His Community," will be given at the Harvard Medical School during the winter under the auspices of the Philips Brooks House Association. The first was delivered by Dr. Richard C. Cabot, professor of clinical medicine at the Medical School, on November 3. At later dates, Reverend George A. Gordon, pastor of the Old South Church, will speak to the students on the "Humanity of the Doctor," and Dr. Joel E. Goldthwait will discuss "The Need of Proper Training of the Youth of Our Country as One of the Most Striking Lessons of the Great War."

#### NEW ENGLAND NOTES.

**GIFT TO HENRY W. PUTNAM MEMORIAL HOSPITAL.**—A gift of \$150,000 has been made by Henry W. Putnam of New York to the Henry W. Putnam Memorial Hospital Association, Bennington, Vermont, for the purpose of building a nurses' home and establishing a permanent endowment for the institution. This gift makes a total of \$375,000 that has been given by Mr. Putnam to the building and equipment of the hospital.

**NEW ENGLAND MEN IN ANTI-TYPHUS CAMPAIGN.**—Three men from New England states have been mentioned as having distinguished themselves in the anti-typhus campaign in Eastern Macedonia, which the American Red Cross Commission in Greece has just brought to a successful finish. They are Captain Paul D. White of Boston, Lieutenant D. S. Clark of Salem, and Lieutenant J. S. Hodgson of Providence. Before enlisting in Red Cross service overseas Captain White was house physician of the Massachusetts General Hospital.

It has been reported that the death rate in the epidemic was held down to twelve per cent., only one hundred and sixty-eight patients dying out of over thirteen hundred cases treated by the American doctors and nurses.

## The Massachusetts Medical Society.

### MIDDLESEX NORTH DISTRICT MEDICAL SOCIETY.

A MEETING of the Middlesex North District Medical Society was held Wednesday, October 29, at the State Infirmary, Tewksbury, Mass. Fellows present, 40. President J. H. Nichols presided.

From 3.30 to 5.30 the various departments of the infirmary were visited and interesting cases were discussed and records examined.

From 5.30 to 6.30 a buffet lunch was served.

Business meeting called to order at 6.45 by President Nichols. Presentation of certificates of honor to "service men," by Dr. W. P. Lawler.

At the close of the business meeting the following program was given by the inmates of the institution, assisted by and under the supervision of their instructors.

Vaudeville by Alfons Kurtzo and his boys.

Violin selection by Mr. Emilio Rovelli.

Mrs. Koebele at the piano.

State Ward Boys in gymnasium work.

JAMES Y. RODGER, *Secretary*.

### Miscellany.

#### SOCIETY NOTICES.

THE MASSACHUSETTS SOCIETY OF EXAMINING PHYSICIANS will meet at the Copley Plaza Hotel at 8 P.M., Monday, November 24, 1919. The meeting will be preceded by a dinner at 6.30.

The speaker will be Dr. Joel E. Goldthwait, whose subject is: "Lessons to be Learned from the War Regarding the Restoration of Function after Injury, and the Need of Proper Training of the Body."

The discussion will be opened by Dr. F. J. Cotton.

WILLIAM PEARCE COVES, M.D., *Secretary*.

THE NORFOLK DISTRICT MEDICAL SOCIETY.—A regular meeting of the Society will be held at Masonic Temple, 171 Warren Street, Roxbury, Tuesday, November 25, 8.15 P.M. Telephone Roxbury 59089.

Business.

Communications:

Types of Pneumonia and Serum Treatment, Fredrick T. Lord, M.D.

Laboratory Methods in the Determination of Types of the Pneumococcus, Cleveland Floyd, M.D.

Present Status of Pneumococcal Vaccine, Bernard W. Carey, M.D.

Discussion by Edward N. Libby, M.D.

BRAIMFORD KENT, M.D., *Secretary*.

THE NEW ENGLAND WOMEN'S MEDICAL SOCIETY.—The Society will meet at Dr. Cummins' office, 45 Bay State Road (Kenmore Station), on Thursday, November 20, at 8 P.M.

There will be a discussion as to the feasibility of a permanent memorial to Dr. Sarah Bond Fraser.

Dr. Edith Hale Swift, of the International Y.W.C.A. Commission, will outline the nature and object of the recent convention of women physicians in New York.

ALICE H. BIGLOW, M.D., *Secretary*.

# The Boston Medical and Surgical Journal

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## Original Articles.

### THE SPECIFIC TREATMENT OF TYPHOID FEVER.\*

BY WILLIAM ROYAL STOKES, M.D., SC.D.,

AND

H. W. MALDEIS, M.D., BALTIMORE, MD.

[From the Departments of Medicine and Pathology of the University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, Md.]

THE first attempt to establish a specific therapy for typhoid fever was made by E. Fraenkel<sup>1</sup> in 1893. He treated 57 cases with intramuscular injections of killed thymus bouillon cultures of the typhoid bacillus. He began with a dose of 0.5 of a c.c., followed by 1 c.c. in 24 hours. These injections often caused a marked drop in the temperature but in two days the temperature often rose again, and an injection of 2 c.c. was often necessary to cause a second and permanent drop which soon reached normal. The treatment also caused a distinct change in the general condition, the diarrhea ceased, and apyrexia usually was attained in from 14 to 16 days.

In 1902 Petruschky<sup>2</sup> used small doses of dead typhoid organisms combined with typhoid immune serum. He began with a dose of 0.05

c.c. and using two injections daily for three days he ended with an injection of 0.3 c.c. He noted marked improvement in his cases, but gives no details concerning the number treated or the results obtained.

In 1908 Tescarolo and Quadroni<sup>3</sup> treated 20 cases of typhoid fever with living attenuated typhoid bacilli. These injections produced severe reactions but they reported favorable results. In 1909 Watters and Eaton<sup>4</sup> treated 30 cases with typhoid vaccine, and in the same year Smallman<sup>5</sup> treated 36 cases in the Indian army with favorable results.

During 1911 and 1912 a fair number of investigators reported the use of typhoid vaccine in the treatment of typhoid fever, and Callison<sup>6</sup> in the latter year reported a series of cases including 38 cases treated by himself. He used 500,000,000 and increased 100,000,000 at four-day intervals as long as required. His results in the main were favorable, and in a number of cases he obtained an early remission of the temperature and a rapid return to normal.

In 423 cases obtained from literature he found a mortality of 5.4% and 6.5% of relapses.

In March, 1915, Krumphaar and Richardson<sup>7</sup> published a study of over 1800 cases in which typhoid vaccine had been used for the

\*Read before the Research Club of Baltimore.

treatment of typhoid fever by about 40 observers, and they include in this description 93 cases which were treated by them or their associates. Their first series of 14 cases were treated with a stock typho-bacterin and the total dosage varied between 50,000,000 to 1,650,000,000 in from one to five doses, the average doses being 926,000,000 per patient. In the second series of 33 cases the vaccine was made from the Rawlings strain, the total doses varying between 200,000,000 and 1,450,000,000 bacteria per c.c. in from one to three doses. In their third series of 16 cases the total dosage ranged between 850,000,000 and 3,350,000,000 in from one to five doses, the average per patient being 1,640,000,000. In this entire series the percentage of deaths was 7.5, of relapses 5.3, and of complications 18.2. In 170 mild cases of typhoid not given vaccine during the same time there were 14 deaths, 16 relapses, and 18 complications, showing respectively a percentage of 8.02, 9.2, and 10.6 for the deaths, relapses, and complications in the untreated cases.

Three deaths in the first series of cases were due to complications of meningitis in one case and perforation in two cases. Two deaths in the second series of cases were due to complicating pneumonia. The authors seem to think that these deaths put the cases beyond the influence of the vaccine, but as all statistics in untreated cases are based upon deaths from complications as well as the straight disease, it would hardly seem fair to reduce their percentage by omitting these cases.

Even including these cases the mortality was reduced to 7.5% as compared to the generally acknowledged mortality of about 10% in cases not treated by vaccine.

The only way to gain a correct idea of the results of any specific treatment in typhoid fever is to study a large number of treated cases, and Krumbhaar and Richardson have made a compilation of 1806 cases. The individual dose varied from 10,000,000 to 1,500,000,000 bacteria per c.c. but the average dose in a large percentage of cases seemed to be about 500,000,000. Two observers who treated only 39 of the total number of cases did not observe the difference between treated and untreated cases, but in the other 95% of cases treated the results were reported as distinctly favorable. In the total number of 1806 cases there were 99 deaths, a percentage

of 5.4, and this contrasts favorably with the 10% for untreated cases. There were 88 relapses, a percentage of 4.8, and this percentage compares favorably with the 8.8 percentage of relapses given by Osler from a study of 28,057 collected cases.

An analysis of the various cases treated by Krumbhaar and Richardson also shows a number of interesting results. In the first series five cases treated before the tenth day dropped to normal in nine, eleven, fifteen, seventeen and seventeen days, and in the second series a few cases treated early in the disease showed a return to normal in from fifteen to seventeen days. Most of this series were treated later in the disease and but few favorable results were obtained. In the third series of cases large doses were given early in the disease. In several cases in which initial doses of 250,000,000 to 300,000,000 were given, followed by 500,000,000, 600,000,000, 700,000,000 800,000,000, and 1,000,000,000 doses, usually with three or four injections to each case, the temperature reached normal in from 14 to 19 days, the first dose being administered on the sixth to the fourteenth day of the disease.

#### DOSAGE.

The best rule of dosage would seem to be that adopted by the above mentioned authors. They recommend for an adult an initial subcutaneous dose of 500,000,000 to be followed by two or more larger doses at three-day intervals. The unit for dosage is 150 pounds, and children should be given proportionate doses according to their weight. The treatment should not be used in moribund or late very toxic cases, or during hemorrhage or suspected perforation.

As a general rule the larger the dose the better the results obtained. When only from 1,000,000 to 2,000,000 bacteria were used there were 14 deaths in 92 cases, whereas from one to three doses of 1,000,000,000 to 1,500,000,000 there was only one death in 42 cases. It is important to institute the treatment early in the disease, as MacArthur\* in his 63 treated cases got 3.1% of deaths, 3.1% of relapses, and 7.9% of complications, all occurring, however, in the 29 cases vaccinated in the unfavorable stage after the tenth day.

In spite of the general opinion that large doses are necessary for good results Petrovitch<sup>9</sup>

reported a reduction of the mortality of 460 treated cases to 3.2% as compared with an 8% fatality of 220 unvaccinated cases. He used from one to three doses of only 20,000,000 bacteria per e.e.

Horner<sup>10</sup> treated 40 cases of typhoid fever with vaccine and compared these with 95 cases in which vaccine was not used for the treatment. The initial dose was 10,000,000 and this was increased daily by 10,000,000 for one week; then on alternate days a 20,000,000 increase was used until the temperature remained normal for three days or the patient had received 700,000,000 dead typhoid bacilli. The inoculations were subcutaneous and produced no systemic reaction. The mortality was 10% for the vaccinated cases and 11.5% for the unvaccinated cases, and complications occurred in 55% of vaccinated cases and 50% of unvaccinated cases. In the uncomplicated vaccinated cases the fever lasted 24.39 days and in the unvaccinated cases 23.08 days. Relapses occurred in 20% of the vaccinated cases and 11.5% of the unvaccinated cases, and hemorrhage, perforation, and pneumonia occurred in 7.5%, 2.5%, and 10.25% respectively of the vaccinated cases as compared to 2.15%, 1.05%, and 4.15% of the unvaccinated cases. The results, therefore, in the vaccinated cases as compared to the unvaccinated cases are entirely negative as regards any favorable influence over the disease, but these results may be partially due to the failure to use larger doses, as little is known of the effect of small doses even though frequently repeated.

Watters<sup>11</sup> has reported upon the treatment with typhoid vaccine of 158 cases of typhoid fever; eight of these were "in extremis," and discarding these deaths the mortality was only 4.7% as compared to 13% in a parallel series of 100 cases not receiving vaccine. This author used 25,000,000 bacteria as a subcutaneous injection and repeated it every two or four days. He states, however, that much smaller doses such as from 1,000,000 to 2,000,000 bacteria at times transferred critical cases into convalescents. He has also collected the results from 1120 cases of typhoid fever treated by 104 different men. In these cases there were 67 deaths but he believes that ten of these deaths should be excluded from consideration as they were "in extremis" when treated. This leaves a total mortality of 57 or a percentage of five. The general consensus of opinion

more rapid defervescence of fever, the attack was of shorter duration as compared to unvaccinated cases amongst these authors seems to be that the percentage of relapses was decreased, there was a milder course, the general condition of the patient was improved, and the mortality was reduced. The usual doses given by these authors seemed to begin with either 250,000,000 or 500,000,000, and to be gradually increased to 1,000,000,000. A small number of the authors, however, gave much smaller doses, ranging anywhere from 10,000,000 to 100,000,000 bacteria per dose. This author emphasizes the point that an early diagnosis is most important and should be made by blood cultures, as the earlier the treatment the more favorable the results of treatment.

Garbat<sup>12</sup> treated 17 cases of typhoid fever with a sensitized vaccine by subcutaneous inoculations and found that the temperature subsided acutely in two cases and that the other patients ran a milder course than might be expected, the duration of the disease being shortened.

Beginning with the year 1913 the treatment of typhoid fever by vaccine has been modified in three distinct ways. A number of observers have given living sensitized typhoid cultures subcutaneously according to the method originally suggested by Besredka<sup>13</sup> in 1892. Others have given unsensitized killed typhoid cultures intravenously, generally using Vincent's polyvalent, ether-killed antitoxysate, and a third set have administered sensitized living or killed cultures intravenously. The results of these various kinds of treatment have been summarized by Gay and Chickering<sup>14</sup> in the following table:

TABLE 1.  
SUMMARY OF RECENT CASES OF TYPHOID FEVER REPORTED AS TREATED BY NEWER METHODS OF VACCINE TREATMENT.

	AUTHORS	No. CASES	RECOVERED PER CENT.	MORTALITY PER CENT.
1 Cases treated by subcutaneous injection of sensitized vaccine .....	11	253	57.0*	7.1
2 Cases treated by intravenous injection of untreated vaccine .....	11	259	63.0	19.6*
3 Cases treated by intravenous injection of sensitized vaccine .....	8	207	81.8	9.6

\* Due in part to inclusion of a large number of war cases of Poland, where delayed transportation from the front increased mortality.

† Of 201 cases.

The results as expressed in the above table show a perceptible benefit in all of the methods used but with little influence on the fatality, but the best results were obtained by the intravenous injection of the sensitized living or killed cultures of the typhoid bacillus.

Ishikawa<sup>15</sup> has reported the treatment of 87 cases of typhoid fever by intravenous injection of a sensitized vaccine. This treatment resulted in an immediate and permanent recovery in about half of the cases and considerable improvement in others. The mortality was reduced to about one-half.

Gay and Chickering have also treated a number of typhoid cases themselves by means of the sensitized killed cultures, and their vaccine is made by obtaining a ground sediment of a polyvalent culture of typhoid bacilli which has been sensitized by an antityphoid serum. The cultures are then killed and precipitated by alcohol. These authors claim that the endotoxins are abstracted by using a carbolated saline solution and the remaining sediment of the bodies of the typhoid bacilli are alone used. They claim that such a vaccine gives better results in protecting rabbits against injection with the typhoid bacillus than other types of vaccine employed, and in its prophylactic use in man it produces less symptomatic disturbance and is more protective against typhoid fever than other types of commercial vaccine.

This sensitized typhoid vaccine is given intravenously for therapeutic purposes in doses ranging from 1/100 to 1/10 of a milligram. Most of the doses which were given ranged between 1/50 and 1/25 of a milligram, which would represent respectively 150,000,000 and 300,000,000 bacteria. Such doses when given intravenously produce a reaction which differs in intensity in different individuals, and when the upper range of doses is given they speak of their provoking alarming symptoms in the more susceptible individuals, although no eventual or temporary harm seems to have been done to the patient. They think it better to produce a moderate reaction to bring about the desired results. The average reaction consisted in a chill beginning an hour after the injection, lasting 15 minutes; the temperature rises 1° to 3° within three hours and then falls, and there is a leukopenia as low as 2000 to 3000 per cubic millimeter. The pulse rate is increased to about 120 and slight cyanosis and respiratory distress and discomfort may oc-

cur. The fall in temperature after three hours is accompanied by profuse sweating, relaxation and usually general amelioration of the typhoid symptoms such as headache and delirium. The patient often feels quite well and demands food, and at this time there is a rise in leucocytes of from 15,000 to 40,000 per cubic millimeter and a relative increase of the polymorphonuclear leucocytes to from 80 to 90%. The hyperleucocytosis is a characteristic reaction.

The unfavorable results with this method which have been reported have been based on the use of a vaccine more toxic than the authors' and those who have reported such results do not mention any direct action of the vaccine in producing the ultimate fatal result. The danger of intravenous injection seems to lie in the use of large doses, and Gay and Chickering do not consider that their doses have produced any untoward results. The contraindications, according to the various authors who have used the intravenous method, are hemorrhage, perforation, cholecystitis, pregnancy, and irregular heart action. The best results seem to be obtained by provoking a distinct, but not too severe reaction, characterized particularly by an excursion of the temperature and a hyperleucocytosis. A single injection may be all that is necessary, but as a rule a second injection may be necessary two or three days later before the temperature returns permanently to normal.

These authors treated 53 cases of typhoid fever and in all of these cases a diagnosis was made either by a Widal reaction, blood cultures or cultures from the feces. They divide their results into three groups, and the first group was relatively unaffected by the treatment. This consisted in 18 or 34% of the cases. The 13 cases of group 2, or 24% of the series, showed more or less benefit, a defervescence occurring by lysis following the various injections of vaccine. The duration of the disease was shortened and the course markedly ameliorated. In group 3 there were 22 cases, or 41% of the series, and in these cases an injection of the vaccine resulted in a more or less critical fall of temperature which followed the injection with the vaccine. Although the result of the treatment was favorable in many of the cases, the mortality was not markedly affected, since there were five fatal cases, giving a mortality of a little over 9%. In three of the fatal cases there was hemorrhage, two of which also were



followed by perforation. One of the other fatal cases was not treated until the twenty-first day and typhoid toxemia caused the death of the remaining case. There was no marked change in the number of relapses, since they also had five relapses, or about 5%.

#### SPECIFICITY OF THE TREATMENT.

These authors attribute the results to the hyperleucocytosis which is produced by the injection, and they also make mention of the increase of the antibodies, but do not venture a suggestion as to which of these antibodies is increased. It is impossible at this time to draw any final conclusions as to how the vaccine treatment of typhoid fever produces its beneficial results, as practically no work has been done in analyzing the time of appearance and the marked increase of the antibodies after these vaccine injections of typhoid fever. Stoner<sup>16</sup> has shown that the subcutaneous injection of sensitized typhoid vaccine will produce an increase in the opsonins, the bacteriolysins, and the agglutinins in normal persons, and Haecht and Stoner<sup>17</sup> have shown in rabbits that inoculations of vaccine will produce a fair increase of antibodies two or three days after the first injection. Shoemaker<sup>18</sup> and Russell<sup>19</sup> found that the injection of typhoid vaccine caused an increase in the agglutinative titer to a dilution of from 1-10,000 to 1-20,000 as compared to about 1-10 before the injection of the vaccine. Russell<sup>20</sup> also found an increase in the opsonic power of the blood serum after typhoid inoculation. Wollstein<sup>21</sup> in studying the results of typhoid vaccine in 24 persons found that the titer of the bacteriolysins usually rose from 1-2500 to 1-10,000 after the first dose, from 1-5,000 to 1-20,000 after the second dose, and remained there or even reached 1-40,000, exceptionally 1-80,000, after the third inoculation. It may be that the vaccine stimulates all of the antibodies so that they are formed in cases quickly enough to shorten the disease by quickly destroying large numbers of the typhoid bacilli in the blood and tissues.

The work of Buxton,<sup>22</sup> however, casts some doubt upon the increase of bacteriolysins and opsonins having any direct effect in the destruction of the typhoid bacillus in the undiluted blood. This investigator has shown that the undiluted serum of normal rabbits will

often destroy large numbers of typhoid bacilli, while the undiluted serum of rabbits immunized against the typhoid bacillus will not destroy this organism. One cubic centimeter of the undiluted normal serum usually killed about 10,000,000 typhoid bacilli. The immune serum was obtained by injecting rabbits with typhoid bacilli every ninth day and testing the bacteriolytic power on the seventh day after each inoculation. Such serum failed to kill typhoid bacilli after the rabbits had received two or more injections. These experiments show, therefore, that the undiluted serum of slightly immunized rabbits will kill the typhoid bacillus but if the rabbits are more highly immunized this effect is not produced.

Teague and McWilliams<sup>23</sup> have continued this work in order to study the influence of the intravenous injections of killed typhoid bacilli upon the bactericidal power of the serum of both slightly and highly immunized rabbits. They have also studied the bactericidal power of normal rabbit serum and of normal rabbits who had received one intravenous injection of typhoid bacilli. When normal rabbit serum was used 16, or nearly half of these sera, killed a million or more typhoid bacilli per cubic centimeter; six killed between 100,000 and 1,000,000 per c.c. and three specimens killed less than 10,000 per c.c., two yielding doubtful results.

In a second series of experiments the bacteriolytic effect of the serum upon normal rabbits that had received an intravenous injection of typhoid bacilli they studied this effect both before and after the injection of live or dead bacilli. The doses of typhoid bacilli varied between 15,000,000 and 1,000,000,000, but approximately the same number of typhoid bacilli were killed by the serum withdrawn after the injection of the organisms as by the serum before the animal was injected. The number of bacilli killed varied from 40,000,000 to 5,500 bacteria per cubic centimeter.

The third set of experiments was made to study the influence of the intravenous injection of typhoid bacilli upon the bactericidal property of typhoid immune rabbit serum, the animals having previously received from one to seven injections of dead typhoid bacilli. This injection slightly increased the bacteriolytic power of the immune rabbit serum if from one to two previous injections of typhoid bacilli had been given, but the inhibitory power re-

maintained the same both before and after injection. After the rabbits had received three or more injections their serum destroyed about the same number of bacilli both before and after the injections but did not later inhibit even the smallest dose of typhoid bacilli.

These authors conclude that "the titer of an immune serum as determined by the usual dilution method with the addition of complement is not an indication of the bactericidal power of the blood plasma *in vivo*" and that "the bacteriolytic power of normal and highly immune antityphoid rabbit serum is neither increased nor decreased by the intravenous injection of a large dose of typhoid bacilli; the serum of a rabbit that has received only one or two immunizing injections shows a distinct but not a great increase in its bactericidal power at 5- and 24-hour intervals after such an injection."

In a further investigation<sup>24</sup> these same authors undertook a series of experiments in order to explain the reason for the rapid drop in temperature and the cessation in the typhoid toxemia within 24 hours after the patients had received a large intravenous injection of typhoid vaccine. Rabbits were used and large doses of typhoid vaccine were injected intravenously in one set of animals and a second set of equal number were used as a control. Twenty-four hours later the vaccinated rabbits and the control rabbits were each injected with 1 c.c. of the same suspension of living typhoid bacilli. The intravenous injection of suitable doses of this vaccine enabled these rabbits to withstand a dose of living typhoid bacilli that proved fatal to the normal rabbits. This could not be explained by a greater increase in the antibodies, since these do not appear until four or five days after the injection of vaccine. The authors thought that the results resembled those which occur in many typhoid fever patients after an intravenous injection of typhoid vaccine, the reaction by crisis in both cases occurring usually about twenty-four hours after the injection of the vaccine, this result following an earlier rapid and often extremely high rise in temperature. The result is also not due to any increase in the bacteriolytic power of the normal rabbit serum, since their previous experiments show that such injections do not produce this effect. It is also not due to the increase in the leucocytes in the peripheral blood.

In order to investigate this subject further they obtained a number of sera from normal individuals and also from typhoid patients and endeavored to find out whether the serum of typhoid patients would kill more typhoid bacilli than that of healthy persons. They thought that both kinds of serum destroyed about the same number of organisms, this number varying between 1,000,000 per c.c. and 100,000,000.

In a final résumé of this subject the authors have reviewed the various theories as to the character of typhoid fever and also have endeavored to explain the mechanism of the immunity caused by this disease. The first theory that typhoid fever is a primary septiceimia and that the bacteria pass from some point in the intestinal tract directly into the blood and from thence into the lymph glands and lymphatic apparatus of the intestines is denied by these authors. They and other experimenters have shown that the typhoid bacillus cannot multiply in the blood serum of normal persons. The second theory is that typhoid fever is a primary infection of the intestinal follicles. The lymph glands are next invaded and typhoid bacilli finally enter the blood stream, where they multiply, causing a secondary septiceimia. This is also denied, since the blood serum of typhoid fever patients has usually a very high bactericidal power. The third theory is that in typhoid fever the bacillus finds its way from the alimentary tract to the lymphatic system including the spleen. It develops in this system and occasionally the bacilli overflow into the blood from the lymph organs but do not multiply in the blood. The presence of a small number of typhoid bacilli in the blood during typhoid fever is suggested by the large amounts of blood (10 to 20 c.c.) needed in order to cultivate the organism in fluid media. Typhoid bacilli in the circulation of guinea pigs are also protected against the bacteriolytic serum by their ingestion into leucocytes and a few typhoid bacilli might also remain alive for a short time in the bacteriolytic serum, since it usually requires half an hour or more to completely destroy these bacilli. The real symptoms of typhoid fever may not be caused by the presence of a few bacteria in the circulation or by the extent of the local inflammatory disturbance in the intestine, but it is suggested by Adami that they may be derived from the toxic products of the typhoid bacillus either free in the blood stream or discharged from

the spleen, mesenteric glands and other local lesions.

Teague and McWilliams believe that typhoid fever is such a local infection of the lymphatic system and having accepted this idea of the disease they then review the points of other workers concerning the mechanism of typhoid immunity and end with their own explanation of this phenomenon. They do not believe that the hyperleucocytosis produced by the intravenous injection of typhoid vaccine is the explanation of the artificial immunity because the blood serum itself even without the assistance of the leucocytes is able to destroy most of the bacilli that may enter the blood. It is not due to paralysis of the heat center nor to a rapid mobilization of antibodies. The serum of typhoid patients is always strongly bacteriolytic, and the slight increase in the bacteriolytic antibodies induced by large doses of typhoid vaccine would not cause a very great change for the better in the condition of the patient. The stimulation of the non-specific ferments producing an increase in the protease and lipase of the serum has been offered as an explanation for the cure of typhoid fever patients, since the protease might produce a more rapid splitting of the toxin protein fragments of the typhoid bacillus to the lower non-toxic forms, while an increase in the lipolytic ferments might destroy the typhoid bacillus. This theory will need more experimental work before its acceptance.

It has also been thought that the violent reaction following the intravenous injection of typhoid vaccine may produce a condition of antianaphylaxis with regard to the typhoid proteins. Since the use of colon vaccine seems to cure typhoid patients in the same way as typhoid vaccine the reaction would not seem to be an anaphylactic one since it is not specific. The bacilli might continue to multiply in the local lesions and finally resensitize the patient so that the theory of antianaphylaxis is not accepted by these authors. Their own explanation of the immunity in typhoid fever produced by the intravenous injection of large doses of typhoid fever is as follows:

"We believe that typhoid fever is a local disease and not a septicemia; therefore the curative process must take place at the site of the local lesions. Hughes and Carlson<sup>25</sup> and Becht and Greer<sup>26</sup> showed that in both normal and immune animals the antibody concentration

is greater in the blood serum than in the thoracic lymph. We have seen that in almost all cases of typhoid fever the serum is strongly bacteriolytic for typhoid bacilli throughout the disease; it would seem that the bacteria multiply in certain tissues because the tissue fluid or lymph does not possess this property. If the intravenous injection of vaccine should cause a more active passage of bacteriolytic substances from the blood capillaries into the lymph the destruction of the typhoid bacilli and healing of the local lesions should be effected. This is the hypothesis we wish to suggest.

This explanation might also explain the survival of the treated rabbits in the preceding article.<sup>27</sup> The serum of normal rabbits is usually strongly bacteriolytic for typhoid bacilli; the intravenous injection of the large dose of vaccine probably causes more of the bacteriolytic substances to pass from the blood capillaries into the lymph, so that on the following day the bacteria lodging in the spleen and liver find conditions unfavorable for growth."

#### NON-SPECIFIC TREATMENT.

It has been suggested that other factors may be concerned in the immunity against the typhoid bacillus, and this theory of immunity has been the outcome of the treatment of typhoid fever by certain non-specific substances.

This non-specific vaccine treatment of typhoid fever was first extensively carried out by Rumpf<sup>28</sup> at about the same time that Fraenkel started his specific treatment. He used thymus bouillon cultures of the *Bacillus pyocyaneus* beginning with a dose of 0.5 c.c. every other day for two doses, and then a dose of 1 c.c. was given after 48 hours. These injections often were sufficient to produce a permanent remission and apyrexia but occasionally 2, 4, and 6 c.c. were given at 48 hour intervals before a satisfactory result was obtained.

This non-specific immunity has been recently studied by Jobling and Peterson<sup>29</sup> who first point out that the bacteriolytic and agglutinin titer may not be the all important factors in the recovery from typhoid fever. These authors in trying to explain the practical abortion of the disease claim that this is non-specific, as no immediate changes in the antibody concentration in the patient takes place.

They suggest that the non-specific ferments of the body are stimulated and cause the destruc-

tion of the toxins and invading organisms. An increase in the protease might split up the toxic protein fragments and leave lower non-toxic forms. In addition an increase in the lipolytic ferments might destroy the organisms themselves by dissolving their lipoprotein surface.

Jobling and Peterson<sup>30</sup> in experimenting on a dog gave an intravenous injection of 10 milligrams of dried typhoid bacilli and noted that the serum protease increased from 0.11 to 0.6 milligrams per cubic centimeter. The lipase titer also increased from 1 c.e. hundredth normal sodium hydroxide to 7 c.e. per cubic centimeter of serum. This result seemed to indicate that these substances may play a part in the destruction of the organism in the blood.

These observers also suggest that as the crude typhoid vaccine may do harm by acting on a weak heart or increasing peristalsis, that some split product of the bacterial protein which is non-toxic should be used. The protoalbumose fraction is very toxic, but the secondary proteases are not toxic. Ludke<sup>31</sup> and the authors have already obtained favorable results by the use of this non-toxic protease, and the outcome seems favorable.

The former author obtained favorable results in typhoid fever by the intravenous injection of .001 c.e. of killed cultures of the *Bacillus coli* and artificially obtained deutero-albumose. The dose of the Merck's deutero-albumose was 1 c.e. of either a 2% or 4% solution. Twenty-two cases were treated and seven of these showed a critical fall of temperature soon after the injections. Three cases showed a gradual reduction of temperature that fell to normal in from 5 to 11 days; 3 cases showed no effect. A favorable influence upon the typhoid process, therefore, was obtained in 19 out of 22 cases. The titer of the agglutination curve was not affected by the treatment.

Jobling and Peterson<sup>32</sup> injected a patient on the seventh day with 2 c.e. of a 2% solution of a secondary protease and on the ninth day with a 1% solution. There was a drop of temperature after the first injection and a permanent remission to normal after the second injection. The lipase titer of the serum increased from 0.6 of a c.e. hundredth normal sodium hydroxide to 1.9 c.e. and the protease became positive after the first injection. The proteases in the serum increased from 0.1 mg. (nitrogen) per 5 c.e. of serum to 0.24 mg. in 3 days.

#### RECENT WORK.

The various army surgeons of the Eastern front during the world's war have used typhoid vaccine with favorable results. Biedl, Eggerth and Palttauf<sup>33</sup> treated 43 cases of typhoid fever by intravenous injection of from 0.5 to 1 cubic centimeter of Besredka's sensitized living typhoid bacillus. In all of these cases after a preliminary rise of temperature the temperature reached normal in from 12 to 24 hours. This condition was lasting in all but three cases which later showed rises of temperature due to such complications as endocarditis, purulent parotitis, and suppurative periostitis. In these cases the injections were made from the seventh to the sixteenth day of the disease.

V. Korányi<sup>34</sup> used the Ichikawa vaccine upon 29 cases of typhoid fever. Five of his cases received doses ranging from 0.3 to 0.7 or 0.8 of a cubic centimeter, and as the former dose was considered too small and the latter two doses too large he excluded these cases from his study. The other 24 received from 0.4 to 0.5 of a cubic centimeter of the vaccine. The method of administration is not mentioned but it is presumed that the vaccine was given by intravenous injection, as this was the method recommended by Ichikawa. None of these 24 cases died, and the reaction following the vaccine followed four distinct courses. Soon after the injection the usual chill and rise of temperature took place and no symptoms of collapse were noted. Seven of these cases exhibited a fall of temperature to normal by a crisis; three showed a fall of temperature to normal by lysis within a few days; seven showed distinct betterment after treatment but no distinct change in the duration of the disease, and seven cases were not influenced by the treatment.

Goldscheider and Aust<sup>35</sup> made quite an extensive study of the results following the injection of 57 cases of typhoid. They began with doses of 250,000,000 typhoid bacilli but later used doses of 500,000,000 and 750,000,000 organisms. In 52 cases which were treated with 250,000,000 bacilli or by 500,000,000 bacilli the results were as follows: The cases treated by the former method showed a rapid fall of the temperature to normal or a more gradual remission of the fever in 72.9% of cases, while when the latter dose was used these effects were noted in 62.9% of cases. With the former method of dosage 27% of cases showed no results, while

with the latter dosage 37% of cases were without beneficial results. Five cases were treated with 750,000,000 typhoid bacilli and four showed rapid decline of temperature to normal, while one showed a lower remission with an evident shortening of the disease. Subcutaneous injections were given, and in a few cases second doses at the end of a week were administered, and these seemed at times to increase the favorable effect of the first dose. This article contains a very complete analysis of the results of this subject.

Csernel and Márton<sup>36</sup> regard the sensitized vaccine of Besredka as dangerous and have produced a vaccine by washing ten or fifteen agar plates of the typhoid bacillus and incubating for 24 hours. They then wash off the growth in 0.9% salt solution, count the number of bacteria with the blood counter and preserve with  $\frac{1}{2}$ % carbolic acid. They dilute the suspension so that one cubic centimeter contains 15,000,000 bacteria, and they injected this polyvalent vaccine intravenously in doses of  $\frac{1}{4}$ ,  $\frac{1}{2}$  and 1 cubic centimeter. These injections were followed by the usual chill and rise of temperature, followed by a fall of temperature by crisis in three cases. In five cases after the fall of temperature the fever rose for a few days but then fell again to normal. In one severe case the temperature fell gradually by lysis. In one case the first vaccination showed no effect but a second dose four days later produced a gradual decline of fever. In five cases there was a shortening of the period of fever. In three cases the patients were free from fever for three days but the temperature then rose and then gradually fell to normal, showing a shortening of the period of fever. One case developed pneumonia and one died from intestinal perforation. These authors conclude that the intravenous injection of this vaccine at times produces a critical fall of temperature and at other times produces a strong oscillation of the continued fever and modifies the intensity of the disease.

Mazza<sup>37</sup> reports the results of several other observers in the use of typhoid vaccine in the treatment of typhoid fever and mentions the work of Arden-Delteil, Négri, and Reynaud,<sup>38</sup> who used the sensitized Besredka vaccine in 37 cases, with a mortality of 8.3%. Netter using the same vaccine had a mortality of 7.1% in 18 cases and reduced the average duration of the disease from 21 in untreated cases to 14 in

treated cases. Von Petrovich<sup>39</sup> used the Wright vaccine in 220 cases in Serbia during the war and had a mortality of only 2.9%, while those who were not treated showed a mortality of 12.8%. Weil<sup>41</sup> treated 14 children with the ether-killed Vincent vaccine with a mortality of 0.0% and Variot<sup>42</sup> treated 69 children with this preparation with brilliant results and demonstrated its lack of danger.

F. Torres<sup>43</sup> used the vaccine of Chantemesse by the intravenous method in six cases in which three died and three showed a gradual fall of temperature followed by a permanent afebrile condition. Dessy, Grappiolo and Fossati<sup>44</sup> used a polyvalent vaccine made according to the method of Lustig in which the protein was abstracted by alkali in which one cubic centimeter of the preparation represented 0.001 of a cubic centimeter of the fresh bacterial suspension corresponding to about 500,000,000 bacteria. They injected  $\frac{1}{5}$  of a cubic centimeter subcutaneously and after one to three days from 1 to 2 cubic centimeters intravenously. The five cases treated showed favorable results. The subcutaneous doses comprised 200,000,000 bacteria given at 12-hour intervals for three injections, 250,000,000 to 300,000,000 given in three days at 5-day intervals, and 1,000,000,000 bacteria followed in 8 days by 1,500,000,000.

#### PERSONAL OBSERVATIONS.

The first set of cases with which we have had experience consists in 31 cases treated at the Mercy Hospital. The dosage used was 10,000,000 bacteria usually given subcutaneously at intervals of several days. The number of doses varied between one and six. We simply mention these cases to emphasize the opinion that no practical results were obtained by this small dosage since the average duration of the disease was 30 days, and cases which even received the first dose on the second, third, and fourth days showed no tendency towards a decrease in the duration of the disease. The mortality in these cases was 5, or 16.1%, but of course a percentage based upon such a small number of cases is not reliable.

The next set of cases was treated during 1913 and consisted of about 60 cases. Doses beginning with 50,000,000 with an increase to 100,000,000 and 250,000,000 at intervals of several days were used. We regret that the record cards relating to these cases have been lost but the general impression of the physicians who

examined these cases, however, was that the duration of the disease was shortened in a fair number of cases and that not a few showed actual rapid decline of the temperature to normal after several of the doses had been given.

Our third series of 10 cases were treated in 1916 at the University Hospital by intravenous injections of a sensitized typhoid vaccine made from the Rawling's strain. Immune serum was added to the vaccine until the agglutinins had all been saturated by the immune serum. Of these 10 cases six were treated before the tenth day and were verified by blood cultures and the Widal reaction. Four cases were treated after the tenth day and showed only a positive Widal test, the blood cultures being negative. In five of the six early cases treated two injections were given at intervals of about four days and in three of these cases the disease seemed to be aborted. In two other cases the temperature gradually dropped to normal in about 18 days and remained so. In the other early case only one injection was given and the case followed the regular typhoid course. Doses of 300,000-900 bacteria were given and the injection was followed by a slight chill and a rise in temperature of from 1 to 1½°, and no dangerous symptoms were noted. In the four late cases the Widal was positive but the blood culture was negative and the vaccine did no harm but no apparent benefit was derived from the treatment.

#### A CURATIVE SERUM FOR TYPHOID FEVER.

Very little work has been done in attempting to produce a curative serum for typhoid fever. This method of treatment would be brought about only by the production of a passive immunity and not by any physiological action produced by the injection of the live or dead typhoid bacilli contained in the vaccines. The immune bodies such as the agglutinins, the bacteriolyins and the opsonins are simply introduced into the body by the injection of the serum containing these substances. Chantemesse<sup>12</sup> produced a curative serum by injecting horses with the endotoxin of the typhoid bacillus, and he obtained a fatality of 3% in 168 cases as compared to that of 19% in the hospitals of Paris. One of us (Stokes) and Fulton<sup>13</sup> prepared a curative serum by injecting hogs with increasing doses of bouillon cultures of the typhoid bacillus and produced a serum with an agglutinative titer of 1-15,000. This

serum also protected guinea pigs against from four to five times the minimum fatal dose of the typhoid bacillus. Twenty-three cases were treated in all stages of the disease with two deaths, one resulting from otitis media and the other from intestinal hemorrhage; 15 of the other 21 cases seemed to show favorable results from the use of the serum.

#### CONCLUSIONS.

The disease known as typhoid fever was described by Hippocrates about 400 years B.C. as a continued fever with diarrhea; offensive, watery stools; bilious vomiting; tympanitis, abdominal pain; red rashes; epistaxis; sleeplessness; coma; delirium; subsultus; irregular remissions; a lengthened duration; and emaciation. The disease has been known to medical observers for about 2300 years, although during the latter centuries it was confused with typhus fever.

During all of this time the disease has been accompanied by the inevitable, unavoidable, preordained fatality of about 10%\*, and not one of the hundreds of remedies and treatments proposed, used, forsaken, and forgotten has changed this immutable figure.

It would appear from recent developments that this fatal figure can be reduced by a specific and even, perhaps, by a non-specific treatment.

This treatment should be studied in all of its aspects and, if the risks can be reduced to a minimum by the use of non-toxic substances which are as efficacious as the cruder materials, such materials should be used. The treatment by a curative serum, both alone and in combination with the vaccine treatment, should also be tried out.

Large numbers of cases should be treated by the various methods, and each group should be compared with the other groups and with a group of untreated ones. These observations

\* The fatality in typhoid fever of course varies according to the age, season, station in life, and place of treatment, but Murchison, in the "Continued Fevers of Great Britain," 1884, shows that the fatality in the London and French hospitals was respectively 17.26% and 17.45%. Osler, in his "Principles and Practice of Medicine," 1916, states that the fatality in 1500 cases in Johns Hopkins Hospital was 9.1%, but that it may vary in private practice from 5% to 12%, and in hospital practice from 7% to 20%. The hospitals probably receiving a larger percentage of the more serious cases. While, in "Typhoid Fever," 1908, states that "when complete statistics are obtained the percentage fatality in typhoid fever almost never exceeds 10%." From 1914 to 1918 inclusive, there were 9,119 cases of typhoid fever reported in the State Department of Health from Maryland, exclusive of Baltimore. Vital statistics, and Dr. E. V. Butler, Chief of the Bureau of Vital Statistics, believes that the registration of cases is practically complete. The fatality varied between a maximum of 11.9 and a minimum of 8.7, and the average fatality for the period of 5 years was 9.6%. This figure might be considered as fairly accurate, since it represents all varieties of cases.

should include the statistical study of the fatality, percentage of complications, relapses, and unfavorable symptoms in the various groups, and the height of fever and duration of fever.

Numerous observations should be made of the appearance and concentration of the various antibodies and ferments in the blood and lymph, if possible, of the various groups in order to understand the mechanism of the immunity produced and to ascertain the best mode of treatment.

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## WHAT IS INFLUENZA?

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THE pandemic has shown how little is known of the cause and nature of influenza. If the disease had appeared for the first time in human history it could scarcely have produced greater confusion. If, instead of striking, as it did, like an old enemy, and after flying its warning signals for months before the attack, it had come unheralded and for the first time, it could scarcely have found the world less pre-

pared for it. Nobody seemed to recognize the disease or to know what to do—or what it was useless to do—in order to stop it.

Now that the blow had been delivered it is desirable to see what lessons can be learned from it. It is necessary to be prepared for what may still be in store for us. It is by no means possible that we are done with the disease. It seems to have disappeared for the present, but it may return.

And there is still another and an equally good reason for studying this pandemic. Information gained in connection with the influenza may be valuable in dealing with other respiratory infections. It is unnecessary to say how useful such facts promise to be when it is remembered that respiratory diseases as a class constitute the leading cause of death in most civilized communities under normal conditions.

## THE EPIDEMIC ASPECTS.

It is curious to observe how little that is strictly accurate is known about the epidemiological aspects of the disease which has just been prevalent. There is even disagreement as to the identity of what we call influenza. Where it came from, why it struck when it did, as it did, and even the force of the blow, are largely matters of conjecture.

The records now available of many of the city and camp epidemics included in the great outburst are so inaccurate as hardly to warrant a scientific statistical discussion of them. The records of the eases are inaccurate because of uncertain diagnoses and lack of reliable reporting.

The cases which were complicated with pneumonia were reported more correctly than the cases of influenza alone because the diagnosis was more certain, the number smaller and the disease more grave.

The records of death more nearly approach to accuracy than do the records of cases either of influenza or pneumonia. But even here the data are not wholly reliable. During the period of the pandemic, deaths were ascribed to influenza or pneumonia which, under ordinary circumstances, would have been attributed to other causes. And unless the consequences of this pandemic differ from those of its predecessors, many deaths largely attributable to influenza will, for a long time, be reported by physicians as due to other causes. This is likely to be the

ease particularly in respect to the less commonly recognized sequelae.

The question of what should be set down as the cause of death where influenza was but one of two or more diseases from which the patient suffered should have received careful consideration in each instance. Attempts have been made to regulate all such questions by rule. The Manual of the International List of the Causes of Death suggests that (1) if one of two diseases is an immediate and frequent complication of another it is the other which should be set down as the primary cause of death. If this rule cannot be followed, the manual proposes that others be applied in the following order, it being understood that as soon as a rule is found which is capable of deciding the matter no subsequently mentioned rule is to be considered; (2) if one disease is surely fatal and the other of less gravity, the former should be stated as the cause; (3) if one is epidemic and the other not so, the death should be ascribed to the epidemic disease; (4) if one is more frequently fatal than the other, the more fatal disease should be given; (5) if none of these rules applies, that diagnosis should be selected which best characterizes the case. In the pandemic only cases which in all probability would have proved fatal without the influenza should not be charged to it.

Had these rules been followed the deaths ascribed to influenza would have been far more numerous than they were. We should not be talking about influenza and pneumonia as though they had been separately epidemic. We should look upon influenza as the essential thing and regard the pneumonia as having been precipitated by the influenza. This seems to be the proper way to look at it and it is so regarded in this paper.

#### THE THREE WAYS OF IDENTIFYING THE DISEASE.

There are three ways of recognizing the identity of an infectious disease: (1) By the clinical evidence, (2) by the bacteriological evidence, (3) by the epidemiological evidence. Each may be useful; each may be conclusive. In case of doubt, none should be overlooked. Let us consider briefly the light which each one of these three kinds of evidence can throw upon the identity of the disease which has been pandemic.

First, as to the clinical aspects. At the out-

break of the pandemic in September, 1918, a memorandum was issued by the Acting Surgeon General of the Army to all camp and division surgeons, surgeons of recruit depots and independent stations, department surgeons and the air service division, in which the characteristic symptoms of the disease, the probable means of transmission and the steps which should be taken against it were stated. It was believed that the conception of influenza which was inherited from another generation still held good. On this point the memorandum said.

"It is important that influenza be kept out of the camps as far as practicable. To this end it must be recognized as a disease which is distinct and separate from the so-called 'cold,' bronchitis, laryngitis, coryza, rhinitis and from 'fever, type undetermined,' which are continually with us and from time to time become prevalent. The influenza which is now epidemic is not a part of, or a cause of, or the consequence of any of these diseases. It is a specific infection with a characteristic symptom complex.

"The leading symptoms are: Severe headache; chills and chilliness; pain in the back and legs; temperature sometimes as high as 104; great prostration; drowsiness. Occasionally there are nervous symptoms; sometimes, but not always, the eyes and air passages of the nose and throat are affected; there may be gastro-intestinal disturbances. The onset is sudden. The bacteriology is not definitely established: Often the Pfeiffer bacillus can be isolated. The most fatal complication is pneumonia. In most instances the patient recovers in three or four days but is entirely incapacitated for duty while the attack is at its height."

The chief symptoms reported from the camps were substantially as thus outlined. Sudden onset, headache, prostration, fever and injected conjunctivae were reported as the most invariable symptoms. The symptoms of the common respiratory infections of ordinary times were not prominent. Coryza was by no means invariable; in some camps as Kearney, Grant, Johnston, and MacArthur it was unusual. Sneezing was not a reliable sign. Sore throat was uncommon, particularly at some camps, as Ice, Johnston, Lewis, and Beauregard. Generally there was coughing, but this may have been due to the bronchitis which was not improbably independently epidemic.



The most serious clinical feature of the disease was its liability to lead to pneumonia. Had it not been for this tendency, the pandemic might not have attracted much attention. Nearly all who died succumbed to pneumonia.

The pneumonia made its attack and proved fatal, probably because the natural protective mechanism of the respiratory tract was destroyed in some way by the influenza. How, nobody can say. But this was obvious: when a patient was attacked by influenza, his damaged respiratory mucous membrane was unequal to the task of preventing the invasion of germs which were capable of growing in the lung and so causing pneumonia. The result was that some of the pneumonia was produced by one organism, some by another; some was primary rather than secondary and was caused by the influenza virus itself.

Second, with regard to the bacteriology. Some think there was no influenza because the bacillus of Pfeiffer was not always found. Others insist that the Pfeiffer bacillus had nothing to do with the matter: that the disease was due to an organism which has not yet been discovered; perhaps to a filterable virus. From the evidence at hand one is not justified in taking either position. It is unwise in the present state of knowledge, or lack of it, to insist that we have not had influenza because the Pfeiffer bacillus has not always been recoverable.

Third, and finally, with reference to the epidemiology. The disease could be identified by its epidemiology alone. No other respiratory infection is so rapid or so universal in its spread; none, so far as known, has such a short period of incubation; none is so disabling and so quickly done with; none so completely baffles the efforts made to control it. Rapidity of action characterizes every aspect of influenza.

If influenza behaves as does other infectious diseases, we ought to regard it as possessing the three following epidemiological forms: (1) Pandemic influenza, (2) epidemic influenza, and (3) endemic influenza. The difference between these types depends both upon the activity of the virus and the susceptibility of the individual members of the population who are exposed to it. The evidence, as shown elsewhere in this paper, indicates that influenza probably possesses these three forms.

#### THE EVOLUTION OF THE PANDEMIC.

Probably nobody will ever be able to say how the highly virulent form of the disease originated or where or when. Inferentially it was developed from a mild infection which was endemic. If this is so, it probably grew in virulence by attacking persons who were especially susceptible to it. Presumably they were susceptible because they had not been exposed to it before. Susceptible visitors to the endemic focus, or travelers passing from such a focus to people who had not experienced influenza, might have furnished the means of its transmission and exaltation.

The exaltation of the virus was probably rapid, not gradual; it developed quickly when all the conditions necessary for it occurred. It probably increased by stages or steps, each representing a state of higher virulence than its predecessor. There may have been one place or many where these changes occurred. Place probably had little to do with the matter; season seems to have nothing to do with it. Social status played no part. The development of high virulence was simply the product of a virus acting in a favorable human environment.

Once the disease had developed into its malignant form, it is not difficult to see how it continued to spread until practically all the susceptible material everywhere was used up. It swept rapidly from place to place, its presence being recognized chiefly by its complications.

The highly virulent state of the virus probably declined as it had increased. As the infective poison met more and more resistant persons, it became more and more reduced in virulence. Finally, the pandemic, which started as a contest between a strong virus and a susceptible population, became a struggle between a weakened virus and an immune population. Then the disease disappeared, so far as its pandemic and epidemic forms are concerned. It could not continue, for it had little to feed on. In this way it returned to its endemic form.

Capacity to undergo marked and rapid changes in virulence appears to be characteristic of the influenza virus. It is perhaps in consequence of this that, under ordinary circumstances, the infective poison is not capable of producing either a great deal of sickness or very severe cases, while from time to time the reverse occurs.

A condition believed to be favorable to in-

crease the virulence is the crowding of many susceptibles together. Crowding favors exaltation by (a) providing short routes of infection, and (b) insuring the transmission of large and repeated doses to many persons. Among a great many some are likely to be particularly effective as accelerators of virulence.

It is easy to imagine how an epidemic wave may be set in motion from a place wherein a virus of uncommon virulence has been produced. It starts when enough force has been gathered by the virus to overcome the resistance of the people among whom it has spread. It is not essential that the highest possible degree of virulence shall be produced in order that a wave shall be started; it is only necessary that a sufficient degree of exaltation shall occur to overcome the immunity which the population possesses.

If this is so, a wave of mild influenza may or may not protect those who experience it from a more severe one. If the difference in virulence is not very great the protection may be sufficient and no wave starts; if it is great and the exposure either excessive or long continued, the immunity may not be enough and an epidemic is set going. It is when a virus which has been for a time restricted is spread to a small group of susceptibles, and has consequently gained a high state of virulence, is suddenly released upon a large susceptible population that the great waves of malignant influenza are produced. In this case it is as though a great deal of energy was accumulated and natural means of defense were not developed.

All this is theory. It is constructed upon biological principles and some observed facts, the whole being put together by inductive reasoning. To hold, the theory must agree with what is known of influenza and it must not contradict any genuinely established fact. It is believed by the writer to answer these requirements at the present time. It is not advanced as a demonstration but as a possible explanation. It is offered as a convenient one to use until a better one is produced.

#### THE DIFFERENCE IN FATALITY.

Among the most interesting features of the pandemic has been the difference which has occurred in the death rates in the different camps and cities of the United States. No useful data are available for the cities because no reliable

records were made of the cases. The case mortality in the camps varied between 4.5 and 30. The lowest rates were in the southern camps and among those which were attacked last. The highest rates were generally on the seaboard and in the northern and eastern sections of the country. If the invasiveness of the infective agent varied as much as did its virulence there was a great difference in the number of people who were taken sick in proportion to the population in different parts of the world. Upon this point there is little evidence, but such as there is indicates that the disease was much less prevalent in some places than in others.

There is no tracing the disease in its progress over the world from the records of cases or of deaths. It seems not to have traveled east or west, but to have scattered in every direction: It was in Switzerland, England, India, and Brazil, in June, 1918. In July it was in China, the Netherlands, Norway, and North Africa. In August it was reported in the United States, Spain, Greece, and the West Indies. By the end of September practically every state in the Union had been visited. Earlier still, influenza was seen in epidemic form in the United States in March, 1918, and an outbreak in a group of southern army camps was reported by the present writer at that time.\* It would not be surprising if many waves had preceded the great and fatal one. Certainly there was a wave of large proportions some months before the main pandemic.

#### THE QUESTION OF SUSCEPTIBILITY.

What of the occasional cases which followed after the main outburst and what of the secondary outbreaks which, in some places, followed the first? How shall we explain the occasional cases which even now are coming to light after nearly a year? Have all these been influenza? Yes, most of them. Some of the late cases were probably as truly influenza as were the early ones.

The late cases did not occur earlier because the victims were not reached by a sufficiently virulent strain of virus to overcome the degree of immunity which they possessed. Susceptibility played a prominent part throughout the pandemic. It was not only the spread of the virus which determined the course which the epidemic took; liability to infection had quite

\* *Journal of Laboratory and Clinical Medicine*, June, 1918, Vol. III, No. 9, p. 567.

as much to do with the distribution of the cases in point of time and space as did the spread of the infective poison itself. This is a general truth which applies to all outbursts of disease. The intensity and extent of an epidemic is not merely a question of how the virus becomes distributed. The distribution is always greater than the cases indicate. In the epidemic of 1918, the statistics of deaths and of cases merely records the rates at which the susceptibles were reached.

Another view which is advanced in order to account for recrudescences and delayed cases is that the infectious matter did not reach all its victims during the height of the epidemic wave, some being isolated in one way or another until the great mass of cases were over. This theory would be more tenable if it could be shown that some people could live in a thickly settled community and not be reached by a virus of such pervasiveness as that of influenza. Such proof is not to be expected. Influenza travels almost as fast as man can travel, showing that it is highly invasive. It is probable that when an epidemic visited a city everybody came in contact with the virus within a few weeks.

It is remarkable to note how the pandemic showed a preference for a certain age group. Young persons and old were relatively immune. This fact has not been satisfactorily explained. There is a possible explanation which, if correct, clears up more than one mystery connected with the pandemic.

It is possible that those who escaped had had influenza before. The old could certainly have experienced an attack during the known visitation of influenza between twenty and thirty years ago. The young may have had it much more recently; they may have had influenza a year ago, or two years ago. They certainly never experienced the severe form of the disease which swept the country in the autumn of 1918, but they may have been attacked in a mild wave, such as that which is known to have occurred in the spring of 1918. This, and apparently this only, could have rendered them immune.

It is not improbable, then, that the wave of September, 1918, was the culmination of other waves and it is within the bounds of reason to suppose that in these others the young and old, or the young alone, were the ones chiefly attacked. If this seems to argue that the influenza then showed a selective preference it can

be replied that this was to be expected. All respiratory infections show a preference for the young and old.

#### WAS THE EPIDEMIC A MIXED INFECTION?

Some persons have been solicitous to know how to interpret the reports of influenza which were made during the course of the epidemic. Do they always refer to the same disease? Has influenza manifold aspects? How broad should the definitions of it be?

Some camps preferred not to call their epidemics influenza at all: Some reported that the type changed during the course of the epidemic. Few reported what some persons think to be the fact, namely, that influenza and other respiratory infections existed side by side.

There are two ways of looking at this subject: The first sets influenza down as a group of more or less similar infections; the other regards the whole group as manifestations of the same disease.

The principal diseases of the group whose members are often called influenza are coryza, rhinitis, pharyngitis and laryngitis. Any of these may be termed a cold, or influenza, according to the preference of the physician or the patient himself.

There is a distinct preference for the use of the term influenza. To most persons a "mere cold" is a trifling affair and they do not want to have a disease which confines them to the house called by that name. Few recognize the meaning of coryza, rhinitis, or pharyngitis. To many even laryngitis does not sound especially significant. On the other hand, influenza or grippe is a popular designation. From our experience of a generation ago, most persons know that influenza may be a serious affair, and there are obvious reasons why it is preferred by the laity and by the doctor to any of the other terms, even though it lacks definiteness. From one point of view this very lack of definiteness is an advantage.

As a means of understanding the relative prevalence of influenza, bronchitis, and pneumonia as reported in civil life, it is interesting to consider the following pre-epidemic statistics.

#### PRE-EPIDEMIC STATISTICS.

Ever since the pandemic of 1889-90, influenza has been supposed to be present in the United States. There have been many restricted and

some moderately pandemic waves reported. In most instances the outbreaks have been fairly local. The disease itself, whatever its identity, has generally been relatively mild. It has not been notably associated with pneumonia.

In the army, what was called influenza was prevalent in 1903, 1904, 1905, 1907, 1908, and 1909. There was remarkably little in 1902 to 1906 and between 1909 and 1914. It has been essentially a winter disease, generally starting from a slight prevalence in December (a rate of less than twenty-five cases per thousand of all troops annually), rising to a maximum in February or March (125 to 175), and falling quickly by April (25) to reach its lowest point (less than 10) in midsummer. In the last twenty years there have been no summer or autumn outbreaks and no recurrent waves such as are characteristic of pandemic influenza. The nearest approach to pandemic pneumonia occurred in 1918, when, after five years of relatively little influenza, there were two periods of prevalence, one in February and March and the other in December.

Compared with the seasonal distribution of bronchitis, influenza has been less evenly distributed through the year in the army: the periods of prevalence have been shorter and sharper and at the times of quiescence the disease has more nearly disappeared. The month of maximum prevalence has often been the same for bronchitis and influenza. In those years in which influenza has been exceptionally prevalent, bronchitis has often been unusually prevalent also. From the studies which have been made, it seems safe to infer that the word "influenza," has been used only as the name of a group of the minor respiratory infections which are prevalent everywhere in the winter months.

With reference to pneumonia, there has until recently been so little pneumonia in the army that the monthly distribution of cases does not appear to be significant. Pneumonia has been almost uniformly present throughout the year, the curve reaching its low-lying summit between January and March and its greatest depression in midsummer.

Turning now to the records of the United States Census Bureau for the forty-seven largest cities of the United States for the seven years 1910-1916, we find the same general seasonal prevalence existed in influenza, bronchitis, and pneumonia. We must here shift our attention from cases of disease to deaths, since the Census

Bureau only deals with the death records. This somewhat alters the situation, inasmuch as there are relatively few deaths ascribed to influenza and bronchitis and an excessive number to pneumonia in all such statistics. Furthermore, in vital statistics collected from civil communities, the age distribution of the population from which the data are derived is different from that in the army. The death rate from bronchitis is particularly high among children and pneumonia is essentially a disease of old age. One would expect, therefore, to find a good deal more pneumonia in civil life than in the army. Fortunately, the characteristics mentioned do not effect the relative seasonal prevalence.

Influenza, bronchitis, and pneumonia have all been essentially winter diseases in the cities and they have shown a tendency to drag along into spring. January has almost invariably been the month of greatest prevalence for influenza. In more than half the cities influenza has been practically absent between May and November. A few cities have shown an extended prevalence between April and October.

Bronchitis has been so uniformly present all the year through in the cities that it is easier to state when it has been least common than to name the months of its greatest prevalence. Generally, its seasonal distribution has corresponded with that of influenza except that its occurrence has been more continued and less irregular in a few cities where there have been long and severe seasons of it.

Pneumonia has shown less monthly variation than influenza or bronchitis in the cities, but it is essentially a disease of the colder half of the year. According to the statistics available, the month of greatest prevalence has always been December and March.

How are we to interpret the death rates from influenza and bronchitis reported by the cities? Did the people really die of the disease named? Probably not. According to the International List of Causes of Death, pneumonia should have been given as the cause of death in all or nearly all instances. The differences in the death rates from influenza and bronchitis which occur in different cities are probably ascribable to differences in the local custom of naming the disease. What is called influenza in one place may be termed bronchitis in another. It is probable that the high death rate from influenza at New Orleans and the excessive rate from bronchitis at Fall River mean that those cities had a good

deal of sickness which terminated in fatal pneumonia. It is certain that in ordinary times influenza, bronchitis, and pneumonia are frequently confused both in diagnosis and in the custom of reporting.

Probably there is a difference in the leading symptoms which accounts for the preponderance of reports in favor of influenza in some places and of bronchitis in others. Thus, bronchitis may be named in cities where the bronchial and laryngeal symptoms are prominent and frequent, and influenza is given where the nasal symptoms and sinuses are particularly involved. It is reasonable to suppose that there should be a difference in the leading symptoms where the predominating occupations and races are so different as they are among the cities of the United States. Manufacturing towns seem to have an excessive amount of bronchitis, a fact which may likely be due to conditions connected with the industries. Where southern towns have high influenza and bronchitis death rates the excessive mortality is generally ascribed to a predisposition on the part of the negro race to those diseases.

The healthiest cities, so far as bronchitis, influenza, and pneumonia are concerned, are those of the West and Northwest, where neither manufacturing, race, or age contribute to elevate the death rate from respiratory affections. Seattle, Spokane, Portland, Minneapolis, and Oakland have all low rates from these diseases.

Summarizing what has been said here with regard to statistics there is some chance that influenza has been occasionally or continually present in relatively mild form: that it has occasionally swept here and there in more or less broad but mild epidemics; and that it has recently increased greatly in severity.

The weight of evidence of all kinds indicates that the influenza which was pandemic is a highly virulent form of a disease which is common with us.

### Clinical Department.

#### CASE REPORT: TRANSPOSITION OF VISCERA, TERTIARY SYPHILIS.

By C. GUY LANE, M.D., BOSTON.

C. J. M., 27 years old, white, single, cook in the U. S. Fire & Guard, was referred to the dermatological ward of the Embarkation Hospital, Newport News, Va., because of an ulcer

on the outer surface of the left lower leg, and an eruption on the face and scalp. In the course of the examination it was noted that there was a visible impulse in the fifth right interspace inside the nipple line. With the stethoscope the point of maximum intensity of the heart sounds was found to be coincident with this impulse, and the heart sounds were found to be normal in rate and rhythm, regular and clear cut, without murmurs. Percussion indicated the right border of dullness to be 2 cm. inside the right nipple line at this place, the upper border at the fourth rib, and the left border at the midsternal line. On the left side of the chest in front, resonance extended to the fifth rib, and in the back both sides were resonant throughout. The lungs showed clear vesicular breathing everywhere with no râles.

Inspection of the skin demonstrated the fact that there were several different types of lesions present. On the face, neck and ears were several discrete, rather large, rounded papules, brown-red in color, some of them with gray scales adherent. Near the hair margin on the back of the scalp were three lesions, distinctly annular in arrangement, and made up of small, crusted papules with the hair matted to them. On the outer aspect of the left lower leg, near the malleolus, was a circular, punched-out ulcer, about 2 cm. in diameter, rather shallow, with a sluggish granulating base and surrounded by an area of redness about 1 cm. wide. These manifestations warranted a diagnosis of late or tertiary syphilis, and from the findings in the chest a tentative diagnosis of dextrocardia was made until confirmation could be obtained from x-ray examination.

The following day a fluoroscopic examination showed a pulsating shadow, corresponding in size to the normal heart shadow, on the right side of the chest. It showed the diaphragm moving evenly on both sides, and slightly higher on the left. Both chests were clear and showed no signs of fluid, masses, or adhesions to distort the position of the heart. Stereoscopic plates of the chest taken at this time and examined later confirmed the above findings. A barium meal was given and immediate pictures showed the stomach shadow located on the right side of the abdomen, and a picture taken at the time of giving a barium enema showed the tube pointing upwards on the right side, and the shadow of the barium



in the sigmoid flexure and descending colon on the right side. By means of the fluoroscope, during the process of giving the enema, the filling of the descending and the transverse colons was observed. The pictures taken 24 hours later showed the remains of the barium in the intestinal tract and confirmed the transposition of these organs.

The family history of the soldier was negative, and his only previous illnesses were measles, whooping cough, and mumps, which had occurred in childhood. An interesting fact, in view of his present condition, developed in questioning the patient, namely the fact that he was born with a right clubfoot. This had been operated on at the age of two or three years, to the best of his knowledge, and he remembers wearing a brace for some time, but thinks that it was discontinued before he went to school.

No history of syphilitic infection could be obtained, and no secondary manifestations had ever occurred, according to his statement. The ulcer on his leg had been present for six weeks, and he remembered no injury to that place. The eruption had appeared a little later. He did

have a rather marked general glandular enlargement, and on the bridge of his nose, left arm, and chest were scars, small, depressed, grouped, with surrounding pigmented areas, suggesting previous lesions of luetic origin. His story about these was very vague and unsatisfactory. There were no scars or pigmented areas on his penis. His pupils were equal and reacted to light and distance. There was no Romberg, and his knee jerks and plantar reflexes were normal. His urine was normal, and a blood Wassermann gave a 2 plus reaction (army scale).

Further inquiry elicited the fact that he had been in the Army since August, 1918, a period of about 4½ months, during which time he had been subjected to the usual examinations and inspections. Previous to that time, for a period of fourteen years, he had followed the trade of a wood-worker. He had gone through school and business college, indulged in sports and games, and then followed his trade, including some fairly heavy work, without any discomfort or circulatory disturbance whatever. In fact, he did not realize that he was built any differently than the average individual, and had suffered no inconvenience from the condition.

His lesions healed in about three weeks under intensive treatment with arsphenamine and mercury, leaving some pigmentation. Later he was discharged from the service on a certificate of disability because of tertiary syphilis.

#### SUMMARY.

A case of complete congenital transposition of viscera, functioning perfectly, unrecognized up to the present time, associated with tertiary syphilis having no history of previous symptoms.

### Book Reviews.

*The Surgical Clinics of Chicago.* February, 1919. Volume 3, Number 1. With 75 Illustrations. Published Bi-monthly. Philadelphia and London: W. B. Saunders Company, 1919.

This is an unusually interesting number.

Dr. Carl Beck contributes three cases of Facial Plastic: Dr. Frank Edward Simpson, "Radium in Malignant Diseases; demonstration of Three Patients Treated With Radium;" Dr. John R. Hargar, "Sarcoma of the liver in a Child of Seventeen Months; Sarcoma of Testicle, with Metastases in the Lung Simulating Tuberculosis;" Dr. Gustav Kolischer and Dr. J. S. Eisenstaedt report five Genito-Urinary cases: Dr. Charles Morgan McKenna, three Genito-Urinary cases; Dr. Maximilian J. Hubeny, "Roentgenologic Demonstration of Several Unusual Conditions of the Genito-Urinary Tract;" Dr. George E. Shambaugh, "Diagnosis and Treatment of Certain Otolaryngologic Conditions;" Dr. Edward H. Ochsner, "Three Cases of Sinus Disease;" Dr. Edward Louis Moorhead, a report of four interesting cases; Dr. Daniel A. Orth, "Strangulated Femoral Hernia Operated under Spinal Anesthesia;" Dr. Thomas J. Watkins, an interesting case of "Post-Operative Catheter Cystitis;" Dr. A. J. Ochsner, "Hypospadias. Excision of Ganglion from Hand;" Dr. Maurice A. Bernstein, "Talipes Cavus (Talipes Plantaris, Contracted or Hollow Foot)."

Major Speed describes vividly some of his work at the Evacuation Hospital and gives interesting general facts considering his experiences in war surgery; Lieutenant-Colonel Fredrick A. Besley also writes from France and describes his methods of transfusion in secondary hemorrhage; Dr. Victor D. Lespinasse gives in detail methods employed by him in transfusion. It is to be noticed that Dr. Arthur

Dean Bevan does a side to side anastomosis after resection of the ileum, and advocates it as against the end to end anastomosis; this is surprising, coming from a surgeon of Dr. Bevan's ability.

The book is as usual very well illustrated.

*Physiology for Nurses.* By WILLIAM GAY CHRISTIAN, M.D., and CHARLES C. HASKELL, M.A., M.D.

*Hygiene for Nurses.* By NOEL MUMFORD, M.D.  
*Nursing in Diseases of Children.* By CARL G. LEO-WOLF, M.D.

St. Louis: Mosby Company. 1918.

Three books have been published lately which will be found unusually valuable to members of the nursing profession. They have been written particularly for the nurse for the purpose of developing her powers of observation and enabling her to meet many of the problems which arise in her work.

*Physiology for Nurses* is an elementary textbook. As some knowledge of anatomy, physics, and chemistry is assumed by the author, full explanation has not been given of the technical terms employed. This book is clearly arranged, expressed concisely, and well illustrated.

The subject of hygiene is considered in *Hygiene for Nurses*. The purpose of the book is to present the most important facts without burdening the nurse with statistics. Eugenics, pregnancy, the causes and transmission of disease, immunity, food, and disinfection are some of the subjects discussed. The systematic arrangement of this book and more than seventy illustrations make it particularly valuable for the pupil nurse.

Among the most useful and practical textbooks for nurses is *Nursing in Diseases of Children*. As diagnosis and treatment are considered the province of the physician rather than of the nurse, reference to these subjects is omitted. This volume considers the physiology of the child, the problems of clothing and feeding, the cause of disturbances of nutrition, diseases caused by abnormal metabolism, methods of examining children, public health nursing, and mental hygiene. This book contains more than seventy charts and illustrations.

*A Laboratory Manual for Elementary Zoology*  
By L. H. HYMAN. Chicago: The University of Chicago Press. 1919.

This volume, prepared for a class in the University of Chicago, presents a detailed outline of elementary zoology. The book includes various general directions, including instructions in the use of the microscope, which will be found

helpful by the beginner. The author believes it to be more satisfactory to begin the course with the dissection of the complex animal, rather than to start with the lower vertebrates whose simplicity is not appreciated unless it can be compared with the higher animal forms. The main part of the book, therefore, is devoted to the anatomy of the frog. A general survey of the frog describes methods of killing the animal, its external anatomy, and general internal structure. The functions of the nervous, muscular, digestive, respiratory, excretory, circulatory, and reproductive systems are considered, and their anatomy studied in detail. Sections dealing with general histology describe the cells and tissues, and the structure of various organs. Of considerable interest are the chapters on the process of cell division, general embryology, and heredity. In addition to the detailed manner in which the subject is presented, suggested exercises and the instructions offered in carrying out experiments are particularly helpful. In the second part of the book are considered the simpler animal forms, including protozoa, coelenterata, platyhelminthes, annelida, and arthropoda, thus adding material to cover a complete course in elementary zoölogy.

*The Soul in Suffering.* By ROBERT S. CAEROLL.  
New York: The Macmillan Company. 1919.

It is the privilege of physicians to come into close contact with the needs, both physical and spiritual, of their patients, and there are occasions when a sympathetic understanding of the mind and spirit can effect more good than attention to bodily ills. It is the purpose of this volume, *The Soul in Suffering*, to call to the attention of the medical profession the practical benefits which may result from a close relation between medical science and religious aspiration. The author traces the spiritual evolution of man, from the religion of fear and gloom to one of love and joy, together with the forward steps taken by medical science, and analyzes the vital elements in both lines of progress.

Physically, man needs wholesome food, fresh air, and hard work, to ensure good physique. Mentally, he should cease to confuse selfishness with suffering. As for the maintenance of bodily health, a balance between food and physical exercise is necessary; so to prevent illness of soul, the author believes that there must be adopted an attitude toward life which will make of suffering not a master but a test of growth. Great artists of the past, of whom Beethoven, Chopin, and Keats are notable examples, though suffering physically, yet developed a spiritual power which has brought cheer and comfort to generations of sufferers. The author of this volume explains that by the application of both medical science and relig-

ious aspiration to the problems of human existence, may be demonstrated the law of healing, the restoration of harmony between man and physical, mental, and spiritual forces.

*Electricity in Medicine.* By GEORGE W. JACOBY, M.D., and J. RALPH JACOBY, A.B., M.D.  
Philadelphia: P. Blakiston's Sons & Co. 1919.

Electricity has acquired an increased importance in many fields including medicine, during recent years. The use of electricity for therapeutic purposes must be based upon a thorough knowledge of the fundamental laws of electric phenomena. This volume, *Electricity in Medicine*, attempts to explain these fundamental laws, and to make clear the possibilities in utilizing electricity successfully as a remedial agent. The book is based on a work published in 1901 for the System of Physiologic Therapeutics; but it has been entirely rewritten in accordance with the changes which have taken place up to the present time. Electric phenomena are explained by the electron theory, and both the old and the new forms of current and modes of deriving them are explained. Nearly all references to electricity in surgery, x-rays, and phototherapy, have been omitted, since it is considered that these subjects merit separate consideration.

The book is divided into six parts. The first deals with the fundamental laws of electrophysics, and explains frictional and dynamic electricity, the physical, chemical, and physiologic effects of electric current, and various methods of obtaining and altering electromotive force. Part II describes the apparatus required for the therapeutic and diagnostic use of electricity. Electrophysiology and electropathology — are the subject matter of Part III, which discusses the physical comportment of the electric current in the human body, the electrophysiology and electropathology of motor nerves and muscles, and of the sensory, vasomotor, and secretory nerves. Part III considers the principles of electrodiagnosis and electropagnosis. In Part IV, the theoretic basis of electrotherapy is presented, and general methods and effects of the application of various forms of current are considered. In the last section of the book, the subject is treated in a more specialized way, and methods are suggested for applying electrotherapy in diseases of the motor or sensory nerves, the muscles, the nervous system, the articular and osseous system, the alimentary canal, to diseases of metabolism, of the circulatory and respiratory apparatus, of the urogenital apparatus, and to the eye, ear, skin, and teeth. This work contains over two hundred and sixty illustrations, and is a thorough exposition of the use of electricity in medicine.



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## ACTIVITIES OF A MEDICAL COLLEGE.

The services rendered during the war by medical schools all over the country have deepened our consciousness of the magnitude of the work of the medical profession and of new hope and promise for the future. In an address of welcome delivered by Dr. Graham Lusk to the students of Cornell University Medical College, the unselfish achievement of this institution has been outlined.

A year ago, the college was opened with a feeling of sadness, caused by the shadow which had been cast over the world by the Great War, in which Cornell was actively participating. One faculty member gave up his practice and went to Washington to control important matters there. In 1914, Dr. Stimson left the college to serve in the front trenches with the Belgians, and demonstrated by candlelight antiseptic

methods for the treatment of wounds. One professor directed the New York Hospital Unit to France; another had charge of all the pathological laboratories in France. A third was chosen to standardize surgical dressings for the American Red Cross, and also trained one hundred and thirty-five army surgeons in the surgery of war wounds; he finally reached the front in France, and although suffering from an injury which caused him pain at every step, he advanced for many miles with our armies. The mental hardship to the man who stayed at home was commented upon by Dr. Lusk, who quoted as an example of the sacrifice made by some of these men the ease of one professor who, while staying behind in order that the important work might be continued at home, nearly lost his life in conducting gas experiments for the government.

Among its many contributions, the Cornell Medical College may claim the distinction of having constructed the first portable x-ray apparatus for use in the field. Four hundred and twenty-nine men were trained in roentgenology in this institution. One professor, by special knowledge gained in Bellevue Hospital, was able so to perfect the ventilation system in the submarine that one of our boats remained submerged for four days, a world record. The scientific supervisor of the nutrition of the United States Army was sent from Cornell Medical College. Another sent from this institution distributed a million dollars' worth of food among the Serbians and left that country with ninety per cent. of the fields planted. Some of the students entered the regular fighting forces.

Dr. Lusk thus outlined briefly some of the war activities connected with Cornell Medical College. Individual sacrifice has been great, achievement notable. But not with the ceasing of hostilities have professors ceased to make personal sacrifices for the sake of the medical profession and humanity: for "they are in this work of teaching, not for financial reward, but in spite of the lack of it." The salaries of professors have not been increased during the war; yet the professors do not strike, but remain at their posts and support the progress of great experiments unselfishly. It is to a medical school conducted in this spirit, willing and eager to render the deepest devotion to the medical profession, that Dr. Lusk welcomed the new students of medicine to the Cornell Medical College.

### DR. SHATTUCK ASSUMES RED CROSS POST.

DR. GEORGE C. SHATTUCK, after repeated delays due to the longshoremen's strike, has finally sailed to assume his duties at Geneva as Secretary to the Central Medical Bureau of the League of the Red Cross Societies, of which Dr. Richard P. Strong is Director.

Dr. Shattuck worked on tropical ulcer in the government laboratories in Manila, contributing a paper thereupon to the International Dermatological Congress held in New York under the presidency of the late James C. White in 1907. This paper was published in the Transactions of that Congress, and in the *Philippine Journal of Science*, 1907, Vol. II., page 551.

Dr. Shattuck was a member of the Serbian typhus expedition headed by Dr. Strong in 1915, and received the Order of St. Saba. In 1916 he served a term in the Harvard Unit in France with Dr. Hugh Cabot, and returned with him in February, 1917, to the Unit with a commission as Major in the R. A. M. C., engaging for the duration of the war. He returned with the Unit after its discharge in January, 1919. He was one of the eight Harvard men to receive the Honorary A. M. at Commencement, 1919, and later received the British D. S. O.

### MEDICAL NOTES.

**INVESTIGATION OF INFLUENZA.**—The Metropolitan Life Insurance Company has provided resources to carry on investigations into the cause, mode of transmission and treatment of influenza and its complications.

A commission has been appointed consisting of Dr. G. W. McCoy, Director of the Hygienic Laboratory, U. S. Public Health Service; Dr. W. H. Park, Director of the Research Laboratory, New York City Department of Health; Dr. Lee K. Frankel, 3rd Vice-President of the Metropolitan Life Insurance Company; Dr. A. S. Knight, Medical Director of the Metropolitan Life Insurance Company; Dr. M. J. Roseman, Chairman, Professor of Preventive Medicine and Hygiene, Harvard Medical School. Later, Professor E. O. Jordan, of the University of Chicago, and Dr. W. H. Frost, of the U. S. Public Health Service, were invited to join in the work.

Work has already been begun in Washington, New York, Boston, and Chicago, and may be

extended to other places as occasion arises. In this way correlation and coöperation are affected. The object of the commission is primarily to study the cause, mode of spread and treatment of influenza and its complications. Studies are now being made upon the prophylactic value of vaccines against influenza, common colds and pneumonia, properly controlled. Laboratory researches are being conducted to determine the cause of these infections, and a special study is being made of the bacterial flora of the upper respiratory tract in health and disease. Special consideration is being given to the possibility of a filterable virus being the cause of any of these infections.

Coöperation and suggestions have been invited from health officers and others interested.

**NEW YORK AND NEW ENGLAND ASSOCIATION OF RAILWAY SURGEONS.**—The twenty-ninth annual session of this association was held at the Hotel McAlpin, New York City, on October 20, under the presidency of Dr. J. S. Hill of Belkows Falls, Vt.

The attendance was far above the average and Dr. George Chaffee, the corresponding secretary, reports this meeting to have been one of the very best in the history of the Association.

Officers elected for the ensuing year are as follows: President, Dr. Wm. B. Coley, New York City; first vice-president, Dr. J. F. Black, White Plains, N. Y.; second vice-president, Dr. Donald Guthrie, Sayre, Pa.; treasurer, Dr. James M. Hamilton, Rutland, Vt.; corresponding secretary, Dr. George Chaffee, 100 Hawley street, Binghamton, N. Y.; recording secretary, Dr. J. H. Reid, Troy, N. Y.

The following addresses were given at the morning session:

A Case Record of an Infection, by Dr. J. F. Black; Modern Methods Employed in the Treatment of Gas Bacillus Infection, by Dr. Donald Guthrie; Treatment of Crushed Extremities, by Dr. W. L. Estes; The Importance of the Preparation of the Autogenous Bone Graft, and Its Application to Its New Environments, by Dr. Charles Geiger. An address was also delivered by the president, Dr. J. S. Hill.

At the afternoon session, in addition to an address on surgery, the following subjects were discussed:

A Brief Summary of 368 Cases of Bone

Tumor, Especially in Relation to Trauma and Early Diagnosis, by Dr. Joseph C. Bloodgood; Exhibition of Patients Showing the Value of Conservative Treatment of Sarcoma of the Long Bones, by Dr. William B. Coley; Unusual and Interesting Fractures and Dislocations, by Dr. C. W. Hopkins; Safety, First-Aid, and Workmen's Compensation, by F. V. Whiting; With the Armies in the Field, by Commander William A. Bainbridge, M. C., U. S. Navy, R. F.

SERUM AGAINST YELLOW FEVER.—It has been reported to the Navy Department from the medical officer of the American cruiser *Chicago* that during an outbreak of yellow fever at Amapala, Honduras, the anti-yellow fever serum discovered by Dr. Noguchi, a Japanese investigator, has been used successfully.

AMERICAN MEMORIAL HOSPITAL FUND.—Contributions to the New England branch of the French Wounded Fund, for the American Memorial Hospital, have reached the sum of \$236,159.22.

#### BOSTON AND MASSACHUSETTS.

THE WEEK'S DEATH RATE IN BOSTON.—During the week ending November 8, 1919, the number of deaths reported was 186 against 264 last year, with a rate of 12.18 against 17.55 last year. There were 36 deaths under one year of age against 36 last year.

The number of cases of principal reportable diseases were: Diphtheria, 70; scarlet fever, 57; measles, 102; whooping cough, 30; typhoid fever, 1; tuberculosis, 37.

Included in the above were the following cases of non-residents: Diphtheria, 5; scarlet fever, 6; tuberculosis, 5.

Total deaths from these diseases were: Diphtheria, 2; measles, 1; whooping cough, 1; tuberculosis, 16.

Included in the above were the following non-residents: Diphtheria, 1; tuberculosis, 1.

Influenza cases, 8; influenza deaths, 1. Last year: Influenza cases, 72; influenza deaths, 55.

HAMPDEN DISTRICT MEDICAL SOCIETY.—The regular fall meeting was held at the Hotel Worthy, Springfield, on Tuesday afternoon, October 28, 1919. There was a large attendance and personal experiences of medical in-

terest in the war were related by Drs. J. M. Birnie, C. F. Lynch, W. A. R. Chapin, G. H. Burke, P. M. Cort, W. R. Weiser, W. P. Ryan, G. D. Henderson, H. C. Martin, and others.

### Obituary.

#### HENRY KEMBLE OLIVER, M.D.

DR. OLIVER, who died at Boston on October 25, on the eve of his ninetieth birthday, was one of the few remaining members of a generation of Boston physicians which has now nearly passed away.

He came from the oldest of New England stock, being a lineal descendant in the eighth generation from Thomas Oliver, surgeon, who with wife and eight children came from Bristol, England, in the ship "Lion," landing at Boston January 5, 1632, and who was one of the founders of the First Church (the "Westminster Abbey" of Boston) and its ruling elder.

He was born in Salem, the son of General Henry K. Oliver and one of a family of seven children.

His father was a man of unusual and varied talents. A graduate of both Harvard and Dartmouth, at the age of eighteen he began life as a school master, which calling he followed for twenty-five years. Subsequently serving as Adjutant-General of the State of Massachusetts, superintendent of the Atlantic Cotton Mills, and later still, treasurer of the State during the Civil War period, he finally became mayor of Salem. A man of musical talent, he was the author of numerous hymns, one of which, "Federal Street," is widely known to this day. At the time of his death he was known as the foremost citizen of Salem.

With such a sire it is no wonder that the son should take a serious and ambitious view of life, one filled with purpose, to make himself a useful citizen. Dr. Oliver graduated from Harvard in the class of 1852, Dr. David W. Cheever and the Hon. Joseph H. Choate both being members of this class, which now has but three surviving members, George Augustus Peabody, Judge William G. Choate, and Peter C. Brooks. After graduating in 1855 from the Harvard Medical School he went to Europe to complete his medical education. He was one of the pioneers

who "discovered" Vienna as a medical centre, as Paris had been to the previous generation. The early development of the specialties of medicine appears to have been the strong attraction for we find Oliver bringing home with him a laryngoscope and exhibiting it with much élat to his professional elders. His classmates, Derby, Jeffries, Sprague, and White, brought back with them the last words in ophthalmology and dermatology. These members of what afterwards was known as the "Vienna Club" set an example which was followed by at least two generations of American medical students. Dr. Oliver did not establish himself at first as a pure specialist, the time (1860) had hardly come for that, but began general practice in Boston at 10 Joy street. This he relinquished temporarily in 1861 to accept the offer of Rev. Henry W. Bellows of the United States Sanitary Commission, of a position as medical inspector of camps in McClellan's Army, then encamped in front of Washington.

In 1868 he was appointed one of the visiting physicians at the Massachusetts General Hospital and in addition to his general practice he had meanwhile built up a specialty of diseases of the throat and at one time he was lecturer on this subject at the Harvard Medical School. Some of his early instruments are preserved in the collection of the Laryngological Department of the Massachusetts General Hospital. A number of these instruments bore his name.

Dr. Oliver had charge of the late Gardner Brewer, a prominent citizen of Boston, at the time of his death from a malignant disease. Mr. Brewer's daughter, the late Mrs. Arthur Croft, was impelled by this experience to set aside the sum of one hundred thousand dollars for the study of cancer. Dr. Oliver was appointed by Mrs. Croft to take charge of these investigations and in 1880 gave up practice, making frequent visits to Europe to familiarize himself with the latest researches on the origin and treatment of this disease. In 1899, on the death of Mrs. Croft, this sum was placed in charge of Doctors H. K. Oliver and J. Collins Warren as trustees, to continue these studies. This fund was now placed by them in the hands of the Corporation of Harvard College and the "Harvard Cancer Commission" was formed. Dr. Oliver becoming a member of the Commission and serving in that capacity until the time of his death.

While still a student in college he recognized the importance of a competent and sympathetic medical adviser for the undergraduate, a need which was brought home to him by personal experience at that time. The train of thought thus engendered was doubtless sufficiently vivid to remain through middle life and to crystallize gradually into the purpose of the admirable foundation with which his name in future will be connected.

The new department of hygiene, which has been in operation for several years under Dr. Roger Irving Lee as its first professor, was made possible by the gift of Dr. Oliver, who may now be reckoned as one of Harvard's largest benefactors. The fund, which has been added to from time to time, now amounts to several hundred thousand dollars, a sum ample enough to carry out the purposes of the founder. This new department, while in no way conflicting with the responsibilities of the regular college physician, will develop a plan for the physical welfare of the student body of the university on a more comprehensive scale than has ever before been attempted. The physical examination of all students entering college and the system of universal physical training are some of the first fruits of this admirable gift. Dr. Lee's book on "Health and Disease, Their Determining Factors," and dedicated to the unknown benefactor of Harvard, is another valuable product of this foundation.

As designed, and as being carried out, the Henry K. Oliver Foundation is bound to have a far reaching effect upon the physical condition of the young men who come to the university and to place the training of the body more nearly upon the appropriate relation to the training of the mind than has ever before been attempted.

In 1918 Dr. Oliver's sight began to fail owing to the development of cataract in both eyes. An operation in one eye gave temporary relief but left him dependent upon the services of a nurse and attendant. During the past year he had been almost totally blind. This affliction he bore absolutely without complaint and continued to maintain his interest in his plan of service to the university which was gradually unfolding itself.

His general health had continued good in spite of his advanced years and the end came swiftly at the close of a day which had given no sign.

Dr. Oliver is survived by two sisters, Mrs. George L. Andrews of Washington, D. C., and Mrs. Charles G. Cheever of North Andover.

He will be remembered by his professional colleagues in his early career as a pioneer in this country in the treatment of diseases of the throat and in his closing years as a benefactor of a new department in university life designed for student welfare. J. C. W.

### AUGUST HOCH, M.D.

Dr. August Hoch, of late years a resident of Montecito, Calif., distinguished as a psychiatrist, died in San Francisco from nephritis September 25, 1919. Dr. Hoch came to this country for his medical training from Basle, Switzerland, where he was born in 1868. He was graduated at the University of Maryland in 1890 and later studied at the Johns Hopkins University and abroad. He returned again to the United States and undertook as his first work the foundation of a laboratory at McLean Hospital in Boston.

He was particularly versed in neuropathology and also in certain of the newer psychological methods then coming particularly into vogue. Later he served as assistant physician at the Bloomingdale Hospital at White Plains, N. Y., and still later succeeded Dr. Adolf Meyer as Director of the Psychiatric Institute at Ward's Island, New York, and became Professor of Psychiatry at Cornell University Medical School. This was a period of great and productive activity, but unfortunately his health necessitated a change of climate and he went to California in 1917, in the meantime continuing his literary work.

He was particularly interested in the development of the *New York Psychiatric Bulletin* and also was on the medical staff of other journals relating to his chosen subject. On the foundation of the *Archives of Neurology and Psychiatry*, published by the American Medical Association, he was made one of its editorial board. He was a member of the American Neurological Association, the American Medical Association and various societies dealing with his special field. His publications were not particularly numerous but all showed much care in prepara-

tion and offered invariably material and viewpoints which were of distinct value. Some of the more important of his papers were "A Study of Some Cases of Delirium Produced by Drugs," 1906; "The Psychogenic Factors in the Development of Psychoses," 1907; "Constitutional Factors in the Dementia Praecox Group," 1910; "On Some of the Mental Mechanisms in Dementia Praecox," 1911; "Personality and Psychosis," 1911; "The Dementia of Cerebral Arteriosclerosis," 1916. His latest paper was "A Clinical Study of Psychoses Characterized by Distressed Perplexity," which he wrote in conjunction with Dr. Kirby.

Dr. Hoch represented the very best in psychiatric advance in the past two decades. His mind was entirely open to new ideas and he took an extremely friendly attitude toward the psychoanalytic movement in spite of the violent opposition of many of his colleagues. In this he showed his real catholicity of spirit and the admirable balance of his judgment. He recognized distinctly the value of this newer psychology and yet was entirely capable of fitting it into the scheme of knowledge already attained without undue emphasis. It is altogether unfortunate that his death occurred at so relatively early an age, particularly since he had much work in contemplation and was never more enthusiastic in his endeavor to upbuild psychiatry in its broadest aspects.

He had a peculiarly charming personality. Those who knew him well felt always his kindness of spirit, his keen sense of humor, his admirable good fellowship and his high aspiration for all that was best, not only in his profession but also in life at large.

He married abroad and his wife and one daughter survive him.

MEDICAL DEPARTMENT OF THE UNIVERSITY OF PENNSYLVANIA.—It has been announced that in the medical department of the University of Pennsylvania, Dr. William H. F. Addison has been made a full professor of histology and embryology; Dr. Oscar H. Plant has been promoted to a full professorship in pharmacology; and Dr. Byron M. Hendricks and Raymond Stehle have been appointed assistant professors of physiologic chemistry.

## Correspondence.

SUCCESSFUL RESECTION OF THE INTESTINE  
IN 1826.

Mr. Editor:—

While looking up another subject the other day, I came across the report of a case in the *Boston Medical Intelligence* for January 17, 1826. It struck me as worthy of resurrection, and I therefore copied it out.

"A surgical operation of rare occurrence was recently performed in Ravenna, Portage County, Ohio, by Dr. Joseph De Wolf, on a certain McLaughlin of that town."

"The patient had, for a number of years, been afflicted with inguinal hernia."

"On the 17th day of September, in consequence of neglect, it became strangulated and subsequently strictured.....surgical aid was then called in, but it was too late to replace the intestine, and every attempt to reduce the inflammation proved unsuccessful."

"As the only means of saving the life of the patient an operation was determined on. The abdomen was opened in the umbilical region and, the intestine being found mortified to the extent of eight inches, it was found necessary to remove the diseased part together with the mesentery connected with it—an operation extremely hazardous and which was rendered still more difficult in this case in consequence of the strong adhesion of the hernial sac to the muscle, and the necessity of dividing the mesenteric artery."

"The ends of the intestine were then brought together and secured by stitches and the external incision sowed up."

"Four weeks after the operation the patient, who is represented as a man of fifty-seven years of age and of intemperate habits, rode two miles, and is now able to attend to his ordinary business."

Successful resection of the intestine in 1826, without anesthetics, without antiseptics, by a country surgeon (Ravenna had but 3000 inhabitants in 1910) is certainly worthy of record. I should like to know more of this Dr. De Wolf.

Very truly,

S. B. WOODWARD.

## BOYLSTON MEDICAL PRIZES.

The prizes, which are open to public competition, are offered for the best dissertation on questions in medical science proposed by the Boylston Medical Committee.

At the annual meeting held in Boston in 1916 a prize of three hundred dollars was awarded to an essay entitled "Studies of the Streptococcus of Smith," by Wilson G. Smillie, M.D., Cambridge, Mass.

For 1919 there is offered a prize of three hundred dollars and the Boylston Prize Medal, for the best dissertation on the results of original research in medicine, the subject to be chosen by the writer. The Boylston Prize Medal will be added to the money prize only in case the winning essay shows special originality in the investigations detailed.

Dissertations entered for prizes must be in the hands of the Secretary, H. C. Ernst, M.D., Harvard Medical School, Boston, Mass., on or before December 31, 1919.

In awarding these prizes, preference will be given to dissertations which exhibit original work, but if no dissertation is considered worthy of a prize, the award may be withheld.

Each dissertation must bear, in place of the author's name, some sentence or device, and must be accompanied by a sealed packet, bearing the same sentence

or device, and containing the author's name and residence within.

*Any clerk by which the authorship of a dissertation is made known to the Committee will debar such dissertation from competition.*

Dissertations must be printed or typewritten, and their pages must be bound in book form.

All unsuccessful dissertations are deposited with the Secretary, from whom they may be obtained, with the sealed packet unopened, if called for within one year after they have been received.

By an order adopted in 1826, the Secretary was directed to publish annually the following votes:—

1. That the Board does not consider itself as approving the doctrines contained in any of the dissertations to which premiums may be adjudged.
2. That, in case of publication of a successful dissertation, the author be considered as bound to print the above vote in connection therewith.

The Boylston Medical Committee is appointed by the President and Fellows of Harvard College, and consists of the following physicians: William F. Whitney, M.D., Chairman; Harold C. Ernst, M.D., Secretary; William T. Porter, M.D., Edward H. Nichols, M.D., Reid Hunt, M.D., Henry A. Christian, M.D., John Warren, M.D.

The address of the Secretary of the Boylston Medical Committee is Harold C. Ernst, M.D., Harvard Medical School, Boston, Mass.

## SOCIETY NOTICE.

HARVARD MEDICAL SOCIETY.—Next meeting in the Peter Bent Brigham Hospital Amphitheatre (Van Dyke Street entrance), Tuesday evening, December 2, at 8.15 P.M.

## PROGRAM.

1. Clinical Demonstrations.
  2. Dr. W. T. Councilman, "The Historical Development of Modern Conceptions of Tuberculosis."
- Medical students and physicians are cordially invited to attend.

ELLIOTT C. CUTLER, Secretary.

## RECENT DEATHS.

DR. GEORGE H. PAYNE died suddenly at his home in Boston, on September 29, at the age of 51 years. At the time of his death, Dr. Payne was on service with the First Motor Corps, Massachusetts State Guard, serving as dental first lieutenant. He was born in Greenfield, Massachusetts. He was a graduate of the Tufts Dental School and for a number of years he was associated in practice with Dr. Eugene H. Smith, Dean of the Harvard Dental School. For the last fifteen years he had been practicing in Boston. Dr. Payne was Secretary of the State Board of Registration in Dentistry. In 1903 Dr. Payne married Miss Bertha Lane of Boston. His widow, his mother, and a brother survive him. He was a charming and lovable man, and his sad death is a tragedy to all his friends.

FRANCIS CHARLES MURPHY, M.D., died suddenly while visiting a patient in Roxbury, November 2, 1919, aged 60. Dr. Murphy was graduated from Harvard Medical School in 1886, lived in the Back Bay, Boston, and practised in Roxbury. He was a Fellow of the Massachusetts Medical Society.

CORRECTION IN LIST OF PHYSICIANS IN  
SERVICE.

It has been called to our attention that Dr. J. J. Condrick of Brockton was listed in the August 7, 1919, issue of the JOURNAL as having been recommended for a commission but not called to the Service. Dr. Condrick was in active service at Camp Devens, and was honorably discharged December 6, 1918.

# The Boston Medical and Surgical Journal

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## Original Articles.

### ADEQUATE REDUCTION AND CARE IN COLLES'S FRACTURE. NEW METHODS.

By *FREDERIC J. COTTON, M.D.*, BOSTON.

No fracture is so common as Colles's fracture,—none so familiar. Why is it not better handled? I believe because an essential factor, one may almost say *the* essential factor, has been neglected, both in reduction and in treatment.

It has been my fortune of late years to have referred to me very many cases of unsatisfactory results in Colles's fracture, and in nearly every one the trouble has been failure to recognize and to handle this feature—the factor of *backward rocking of the distal fragment*, which, as long as it persists, makes proper reduction of the ulna impossible,—and it is a fact, even a well-recognized fact,—that it is the ulnar luxation, rather than the fracture itself, which gives disability.

I have called attention to this factor of backward rocking before, but perhaps without emphasis. Today I am emphasizing it because I now know how to handle it, and have a method to offer that has stood the test of half a dozen years of use in the hands of myself and my assistants.

When one breaks his wrist, it is the radius that gives way, but the whole damage may best be expressed as a *rotation backward of the hand about the ulnar head as a fixed point*, a rotation which tears the ulnar ligaments loose (the ulnar styloid often giving way with the ligament strain), and *also* breaks the radius. The hand is displaced, *with the radial fragment*, up and back *in toto*, to a varying degree—often great; but, whatever the *total displacement* of broken fragments, *always* we find the *hand displaced backward*,—always the associated *tilting backward of the lower radial fragment*.

We may have *a* or *b* of Fig. 1, but always a tilting back, an *altered angle, of the articular surface*. (See also Fig. 2).

After long observation of this fact, after considerable experience in trying to use the accepted manipulations so as to correct it, it finally occurred to me to reverse, in reducing, the mechanism of production of the deformity. In other words, *if the ulna is the fixed point about which the hand is displaced, make it the fixed point about which one reduces*; if the hand is displaced in extension, *reduce it in flexion*; if it is displaced in a rotation of supination about the ulnar head, *reduce in pronation*.

There is no finality in such a reasoning, but on trial this worked out surprisingly. The older methods of reduction aimed almost entirely at a carrying forward of the lower fragment on the upper. For this they were good, and I use them still—for this. The new matter is—after the obvious displacement of the radius is corrected, then carry the hand about the ulnar head as a fixed point into pronation and flexion. It is simple enough.

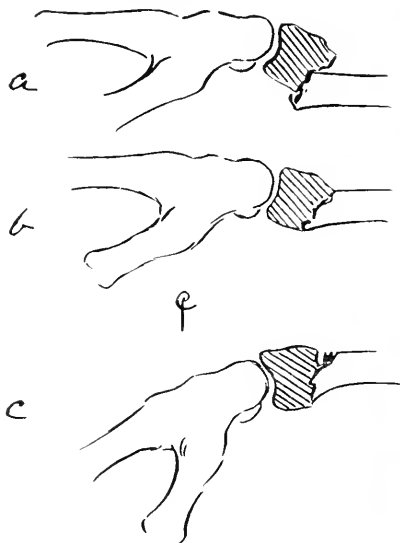


FIG. 1.

- a. Displacement backward.  
b. Rocking backward without total displacement.  
c. Correction of b, showing gap left where bone was crushed by the "impaction."

Figure 3 shows the grips and the motion. A good deal of force is directed up under the ulnar head, a strong drag flexes the hand, and a twist of the whole hand about the ulna finishes the work. This may all be done as one twisting sweep—and easily.—rarely needing repetition.

Now as to retention: If one wishes first-rate results, the average splints are very often inefficient. The musele-tonus holds the fragments against redisplacement *in toto*, but not against rocking back of the distal fragment, the more so as there is often enough crushed and missing bone at the back edge of the fracture to leave a gap. How to hold position I learned from doing osteotomies on old fracture deformities in which one must of necessity keep a wedge-shaped gap open until it fills with bone.

This can be done only in flexion, and flexion is best held in plaster, preferably applied as strip-splints of eight to ten layers of plaster-of-Paris bandage, one on the back, from elbow to finger knuckles, one in front, from upper forearm to palm. These are caught with a few turns of plaster-of-Paris bandage. (See Figs. 6 and 7.)

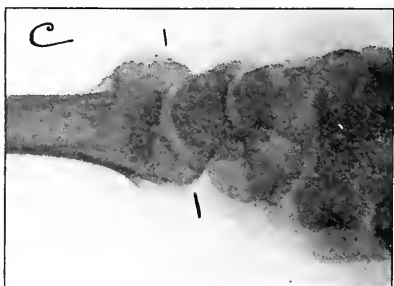
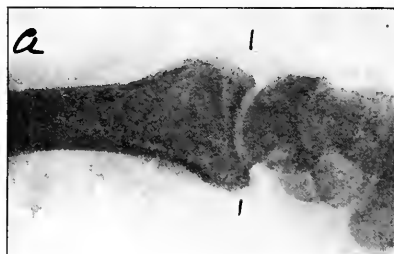


FIG. 2.

- a. Normal slope of articular surface. (This picture is, in fact, from a case of Colles' fracture—from auto backfire—with marked displacement, reduced by the method herein described, just before taking this picture.)  
b. Unreduced fracture. Note the different angle of the wrist joint surface. This fracture was later entirely and easily reduced.  
c. Same tilting of joint surface in another case.

The same thing may be done less efficiently, but often well enough with splints and exag-





Fig. 3.  
First traction and rocking, with the hand a little extended (backward) so as to free the displaced radial ligament and the dislocated ulna; then, with the thumb under the ulna, making it a fixed fulcrum, drag the hand down into flexion and pronation, keeping up traction combined with this flexion and rotation.

generated pads, as shown in Fig. 4. So long as the wrist is in flexion, the posterior ligaments always intact, give the pull that keeps the distal radial fragment from rocking backward;

but find it not uncommonly, *always undiagnosed*, whether slight or considerable in degree.

The flexion position need not be kept up over a fortnight, and it is usually wise, if plaster is used, to slit the plaster along one side after a day or two to ease the circulation. Always remember that the position a little impedes circulation, and watch carefully. In several cases reduced by internes, I have seen a dangerous interference with circulation from too tight a plaster. This is better avoided if one uses the strip-splints of plaster as described, but even that is no security against lack of skill or care. This chance of trouble is the reason I have not until now published this method of fixation, long as I have used it.

After the flexed position is abandoned, use straight splints with exaggerated pads at *a* and *b* (Fig. 4) for a third week—never longer, unless for special reasons,—and then a supporting strap of adhesive with a pad in front of the ulna (the ligaments are the last to heal) to be worn (changed every three to five days) until the hand is strong.

It has been my experience that the hand recovers function more quickly after flexed fixation than after straight splints—I do not know why.

It may not be out of place to consider in more detail the factors of real disability following Colles's fracture.

Firstly there are very many cases of real

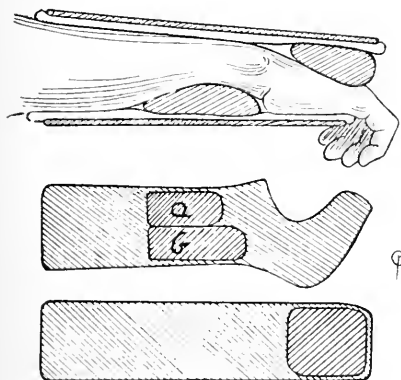


Fig. 4.

and so long as the ulna is held to the *back* of the flexed wrist, the ligaments can heal to something near their normal length. This is important, for not only is there weakness in the ligaments, but their laxity often permits a subluxation of the ulna with each supination,—a common factor of disability. This slipping ulna not very rarely leads to ulnar nerve irritation. I have previously called attention to it,

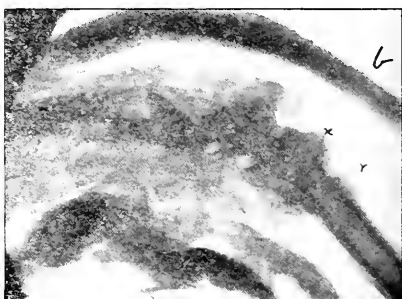
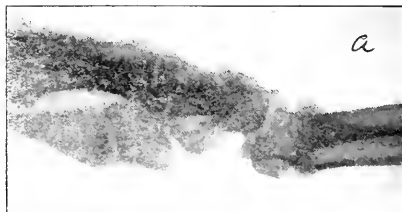
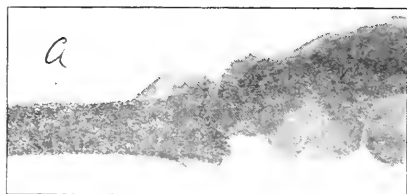


FIG. 5.

- a. Before reduction.  
b. After reduction. In this case splints were used, not plaster.

FIG. 7.

- a. Colley's fracture 10 weeks old. Extreme displacement of radial fragment. Ulnar head locked in front of carpus. Entire loss of flexion of wrist and of supination. Finger flexion interfered with to unusual degree.  
b. Same after open reduction—osteotomy, then reduction by the manipulations described in the text. Shown held in flexion plaster. Note the V-shaped gap between *x* and *y*, successfully held open.

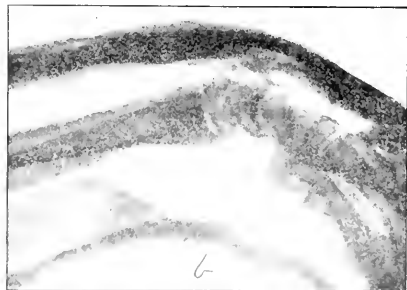
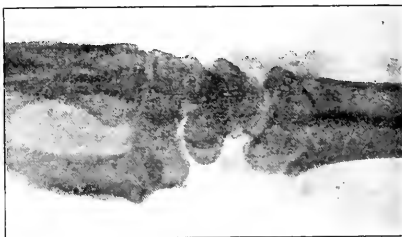
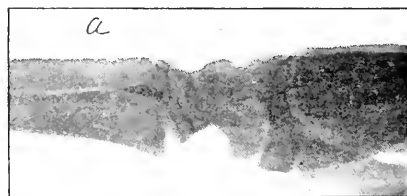


FIG. 6.

- a. Typical old separation in a boy of 15 years, after two attempted reductions (closed).  
b. After reduction through small open incision—reduction by leverage of a rodstone between fragments, shown held in flexion plaster.

FIG. 8.

- a. Three weeks after fracture and alleged reduction.  
b. After reduction with "Thomas" wrench. Shown as held in flexion on splint. (cf. Fig. 4.)

disability sufficient to interfere with special forms of work or special kinds of play.

It is not a fact,—though often so stated,—that the cases with deformity that are not set “do just as well.” The only fact resembling this is that a neglected case often does better than one badly treated (“set” or unset) because, even today, commonly enough, splinting is too long continued, as in the older days it was always kept up too long. Overlong fixation inevitably leads to stiffness—often of the wrist and particularly of the fingers, hard to cure, easy to avoid.

Splinting of three weeks’ duration is enough and, from the time of reduction, splints should never immobilize the fingers. Rarely there is delay of union—here one may have to fix for a longer time, but it must be fixation with massage and exercise or there will be trouble.

In an inescapable minority of cases, traumatic arthritis develops, not necessarily in arthritics or in people with discoverable focal infections, often “out of a clear sky.” It is not a result of good or bad treatment. Usually the diagnosis is obvious—if not, the x-ray will confirm it—the picture of extreme osteoporosis with but trifling joint changes. No change in routine of treatment by splints is called for, but the recovery is very slow. Under prolonged treatment with heat, massage, and gentle motion, these cases usually recover, almost perfectly, but very slowly indeed.

Save for what has just been said, all the disabilities are mechanical.

Worst is the locking of the ulnar head in front against (or even anterior to) the pisiform, blocking flexion and rendering ulnar flexion and supination painful, almost impossible. It is rare. I have seen four cases of such locking (see Fig. 7). This lesion results from a combination of anterior luxation of the ulna with a shortened radius.

Anterior luxation of the ulna is far commoner—common—in some measure almost unusual, and is the commonest cause of trouble in these cases. When slight, it gives only a little weakness or clumsiness, not disabling, but enough to spoil one’s game of tennis.

Of a little higher grade, it gives a weak and uncertain wrist. In such cases, a careful inspection shows not only the loss of prominence of the ulna at the back of the wrist which is so common (Dr. David Cheever used to teach

us it was *always* present after Colles’s fracture), but also a prominence anteriorly and a very distinct increase in both when the hand is thrown over into supination. This is a result of lax ligaments and of the radial deformity to which we shall come presently. In the worst cases, the condition is a veritable recurrent luxation of the ulna with each supination movement. The weakness and pain are very considerable. These, too, are the cases in which ulnar nerve damage, both sensory and motor, occasionally develops.

Fortunately, all these conditions may be remedied by osteotomy and correction even long after the injury, with results far better than one could expect. But they should never be allowed to develop.

Now as to trouble from the radius.

Almost never is any pain complained of at the site of fracture. In many cases tipping back with or without displacement back of the lower fragment gives an unhandy loss of flexion not compensated for by the abnormally free range of extension. More important is the weakness due to the posterior position of the carpus. Most important is the effect on the ulnar side.

Displacement of the hand toward the thumb side may be dismissed briefly. Save for the strain thrown on the ligaments of the ulnar side, it gives no trouble unless the shortening is tremendous, as sometimes occurs with extreme radial *shortening* or from loss of epiphyseal growth when the injury has been sustained in childhood.

As to the effect of radial deformity felt on the ulnar side, it comes to this. Never, so far, have I seen a case with displaced ulna in which the ulnar relation could be made normal until the radius was corrected both as to the site and the angle of the lower fragment, and this holds true whether the case is fresh or an old one only to be corrected by osteotomy. This is probably due to the fact that the radius and ulna down to the point of fracture are held in definite relation by the interosseous membrane, so that any backward displacement of the hand means a backward displacement with relation to the ulna—not correctible save by restoring the radius.

And it is just because the symptoms are mainly on the ulnar side, just to correct the symptoms of what we call ulnar luxation that we must exert more care in radial reductions.

Entanglement of the ulnar styloid in ligaments or radial nerve damage, etc., occur sometimes, but these are accidents, and rare.

The things above described are common, the way to avoid them is open, the trouble worth while.

Save for the cases of excessive fragmentation that one occasionally gets, especially in the aged, and the rather rare cases in which a traumatic arthritis interferes, there seems to be no reason for anything but good anatomical results or for any considerable permanent disability after Colles's fracture.

In the illustrations that accompany this article no attempt has been made to heap up examples, but rather to show the principles followed.

In a not inconsiderable experience through half a dozen years or more, I have carried out this routine without any trouble with regard to the rocking backward of the fragment, and have been able to get reductions that are nearly or quite perfect, both as to radius and ulna. It may be objected that I see a disproportionate number of bad end-results referred to me. This may be true, but I certainly see many bad ones, while I have found it possible to get consistent good results in fresh cases, and to reduce and hold those I do osteotomy on; until I adopted this method my results were uneven, often poor, and this change I believe to be not a matter of skill but of improved method.

## THE PATHOLOGY OF CONSCIENCE.

By ABRAHAM MYERSON, M.D., BOSTON.

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AMONG the types of the over-conscientious there are two especially interesting to the curious student of his kind. One of these will some day engross the life-long attention of a serious historian who will busy himself with the problem, to wit, whether men with principles or men without have done more harm in the world. This first type may be called the *over-conscientious whose peculiarity injures others*. These are the people who inaugurate inquisitions, persecute those differing from them in opinion and conduct, largely because

such procedures are the offspring of the minds and wills of those who allow no question of human error to mitigate their feeling of being right and whose consciences goad them to consistent unrelenting action.

The second group, *those whose conscientiousness hurts themselves*, is represented in the two cases here reported. This type of person continually tortures himself by subjecting his actions and even his thoughts to the stern scrutiny of an over-zealous conscience; life to this class of the misguided has to be totally consistent; peccadillos and frailties are inconsistent and therefore intolerable, and they allow themselves no lapses from a rigid code. Or, rather, they are horrified by those lapses which conscience *cannot* prevent, and consequently they fall into an eternal mental battle waged over small matters. A train of symptoms in many cases results, which brings them to the attention of the neuro-psychiatrist.

The first case concerns a young fellow. Out-Patient Psychopathic Department, Boston State Hospital, No. 9328, who was referred because of the great failure of his mental endurance that had taken place within a year. He complained of severe headaches, dizzy feelings, loss of capacity to study and a depressing pre-occupation with an apparently approaching breakdown. His personal history is interesting. He is a Southerner, of a poverty stricken family, and by dint of exceptional ability and extraordinary exertions has worked his way through High School, Harvard College, and into Harvard Law School. In order to pay his way, he has done tutoring and has taken practically no rest for years. In addition to caring for himself, he is providing for a younger brother, for his reputation as a tutor has reached such a stage that he is able to get very good fees for his work.

The physical examination showed him to be a man of excellent nutrition, of good musculature, in good condition except for a blowing systolic murmur heard best at mitral area. This mitral lesion was well compensated for and unquestionably played no part in his symptoms.

An analysis of the symptoms showed that the headache was really *not a pain but a feeling of tension in the head*, which I find is usually associated with "circular thinking"; that is where a group of ideas and emotions continually obtrude in the consciousness, are

brought into the mind with every stray association despite the will of the patient and, therefore, causing in him weariness and rebellion. The dizziness turned out to be sudden waves of "unreality feeling" dreamlike states in which reality and unreality could hardly be distinguished, "so that my mind reeled." The lack of endurance was largely based on the homely fact that a long inward struggle is debilitating and de-energizing.

This young man's symptoms are therefore, neurasthenic to a high degree, if we accept the idea that fatigue involving the mental function is the central feature of the case; but back of these symptoms as a cause is over-exertion mentally, over concentration on the goal, and back of that a *misguided conscience*. For the sin of sins in his eyes, was "wasting time"; in his code every minute must see forward movement. Nor was this due to over-ambition; it was an *ethical attitude* that forced him to work when his mind and body cried for rest. Therefore he never relaxed but that the pangs of an outraged conscience made him miserable afterwards. His rare moments of pleasure were paid for like the spree of an occasional drunkard; by an intolerable self-accusatory state afterwards. Yet, by nature he was no ascetic, he took pleasure in company, he "liked girls," he rejoiced in sports, that is, he had all the makings of a normal man. But by what may be termed a local defect, or more specifically a *wrongly-acting conscience*, he was kept from enjoyment and relaxation; was in a markedly neurasthenic state.

A very simple course of therapeutics worked marvels. His attitude was held up to ridicule, and its absurdity, its inefficiency exposed to his own view. *It was even declared to be immoral* in that as a general cause of conduct it would deprive the world of all pleasure and break down the social structure. He was advised to give up some of his outside tutoring, to take regular rest during the day, but especially to join pleasure clubs and groups, to become a "regular fellow" rather than a bigot for work. He promised to do this and kept his promise faithfully, especially because the prescription, once his scruples were overcome, filled him with anticipatory delight. In a recent interview he states that he takes part in card games, has joined a golf club, goes to dances, and yet is doing better work than ever before and that he feels "simply great." His recov-

ery, therefore, has been very gratifying and has completely justified the etiological standpoint and the treatment.

The second patient, a stenographer of 27, seen in private practice, presented a much more delicate problem and one where a not inconsiderable degree of danger attended the therapeutic advice. This lady came of a New England stock that was made to order for the novelist, in its hypertrophy of conscience and in the complete repression of all immoral acts and thoughts; with a stern attitude towards any form of self-indulgence coupled with fine ideals of service and duty. Types similar to this girl are seen everywhere in New England; over-earnest, over-scrupulous, and not least in importance, giving so little thought to their own appearance and disdaining so much to use the little artifices by which women make themselves attractive that they are as a result somewhat dowdy. She had always been rather "nervous," that is, easily fatigued, with but a slender appetite and uncertain sleep, with little natural exuberance of spirit, somewhat shy, but friendly. However, she had had no real illness of any kind, had worked well and was a success in her work and loved it despite its difficulties and disappointments. Of late months she had been sleepless and had suffered pain in the back of the neck and the base of the skull, with occasional dizziness. There was, in addition, a very troublesome fatigue, an absent-mindedness that impaired her efficiency, and this, in its turn, irritated and alarmed her. It was admitted that all these symptoms were increased at the menstrual period.

A careful physical examination showed no noteworthy change from the normal except a slight increase in the reflexes. The symptoms were then re-discussed. The headache was no ordinary pain, it was a "tight, full feeling in the head." The dizziness occurred only rarely and was really a conjoined feeling of faintness and instability.

"Do these feelings relate to distressing thoughts?"

She admitted they did.

"Some unhappy love affair?"

"No." (She had had an affair at twenty, but broke it off because of knowledge of misconduct in the young man's past. She did not regret it now.)

"Did the distressing thoughts have anything to do with misdeeds of her own?"

This was a critical question and very apparently took her off her guard. She reluctantly and almost inaudibly admitted they did. It transpired that unfortunately for her each menstrual period was associated with a greatly increased eroticism which rendered her very uncomfortable for a few days and especially at night, and then it vanished. On one occasion, without being really aware what she was doing, since she was in a very sleepy state, she masturbated. Relief came at once and she slept soundly but awoke very self-accusatory. The next period the same thing occurred, except that the act was a deliberate escape from the torture of her excitement. When she awoke she became acutely miserable; thought of herself as a vile sinner beside whom a Magdalene was virtuous; thought her case was unique and without precedent amongst well-bred women. She could not free her mind from its burden; though her erotic feelings were gone, she became engaged in an inward struggle which became obsessive, in that it occupied her mind and was associated with bitter self-accusation and self-reproach. The headache gradually appeared with the continuance of the self-accusatory state. The inwardly directed attention of course prevented the shifting of attention outward so that her efficiency fell off and a vicious circle was set up, *in which self-accusation brought about inefficiency and inefficiency added to self-accusation.*

It is obvious that this case presented a delicate problem in therapeutics, for certain obvious directions are forbidden by morals and law and are besides valueless in the hyperconscientious. Essentially she was told that her act was not so much immoral as unesthetic and besides was exceedingly common. The last statement astonished her greatly and had a commensurate degree of comfort. She said afterwards that a load was lifted from her when she heard this statement. She was told her act was inadvisable, yet if it happened again she was not to fall into a passion of reproach but was to look on it as evidence of a common frailty and nothing serious, either physically or morally.

It may be added that in order to allay the eroticism of the menstrual period, large doses of bromide were prescribed with instructions to use them just before the onset of the menses and throughout the period. She appeared two weeks later, very grateful for her recovery,

though she had not used the bromides. She stated that she had no notion of telling about her failing and would not have consulted a physician had she suspected that it would be divulged. The confession itself gave relief but largely she attributed her recovery to the new point of view which she accepted and used towards her sex difficulty. *In other words, a hyper-conscientious attitude has been dropped and a rational, fully as moral attitude, substituted.*

These two cases though principally cited as illustrating minor and easily adjusted types of hyper-conscientiousness, what might be called obsessive conscientiousness, also exemplify *de-energization*. By this term is meant what is usually called neurasthenia, but there is this difference in that neurasthenia implies that a nervous system is principally involved functionally, but in my belief in a very large number of cases the primary energy difficulty is more of a matter of the whole organism than of the nervous system. Such is the *de-energization* following the infections as influenza, pneumonia, typhoid; such is the type seen in tuberculosis and certain cases of syphilis; such is the *de-energization* of the menopause and other internal glandular derangements where the energy of the organism is attacked by widespread changes.

The most interesting types of *de-energization*, at least to the neuro-psychiatrist, is that which occurs as a result of so-called psychical causes. It cannot be over-emphasized that for the medical man there is no psychic separable from physical. For example, in the last analysis, an *emotion* is a profound disturbance in vaso-visceral-motor-neural relations; that is to say, consists of changes in the blood stream, changes in the secretory activities of the viscera, changes in the tension and position of muscles and joints, and changes in the activity of the nervous system. An *idea* is largely a cerebral excitement tending to arouse memories of other cerebral excitations and to produce motor activity of some kind either of the blood vessels and viscera or of the skeletal muscles or both. In other words, so called psychic activities not only cause modifications of metabolism and function, but may safely enough be considered as modifications of metabolism and function. Their action may be considered as comparable to the action of drugs, for an emotion may effectually duplicate the effect of atropine or

other drugs, *with this essential difference*, that its persistence in memory may cause the effect upon the organism to be repeated frequently each day during the rest of the individual's life. In other words, though comparable to drugs in many respects, emotions are infinitely more potent than drugs in other respects.

Now there are energizing ideas, emotions, sensations, and experiences, and there are more or less indifferent ones. Of great importance socially and medically are the profoundly de-energizing psychic changes which lower endurance, unfavorably modify the metabolism, disturb the appetite, prevent sleep, are associated with pain, etc. Without attempting even in the broadest terms to consider the entire subject, it may be stated that ideas, memories, experiences, emotions and attitudes *that tend favorably to influence the human being's opinion of himself, energize; that those which lower his opinion of himself de-energize and influence the entire organism in an unfavorable way.* Thus, for de-energizing powers, the humiliation, and insult, before which one is powerless, are noteworthy. So, too, a failure of belief in one's self, that is, in one's powers and abilities, hurts efficiency and breeds neurasthenia, as every trainer of athletes knows, as does every man who has struggled against a bad habit. Fear which ultimately is a feeling of impotence or incapacity as against some other force, offers the finest examples of de-energization and its effects range from the sudden swoon of terror to the sleepless, appetiteless, and aching housewife who feels herself becoming a plain drudge, losing youth, beauty, and hope of betterment. The tonic effect of *praise* is related to its increase in self-valuation, just as the depressing effect of *blame* is to be linked up with its self-depreciation. So, too, *success*, either merited or otherwise, increases the energy, and *failure*, even if undeserved, produces a brooding de-energization. I do not mean that *ego-valuation* is the only factor in nervous-energy release and obstruction, but it is one of the great factors.

Indeed it is to be hoped that the poet's prayer that "we may see ourselves as others see us" may never be realized, for, to the majority of us, the shock to our ego-valuation would be profoundly de-energizing.

## LOW ARTERIAL TENSION, ETC.

BY GEORGE VAN NESS DEARBORN, M.D., CAMBRIDGE, MASS.,

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AN editorial entitled "Low Pulse Pressures" interested many readers of the JOURNAL, and although printed May 23, 1918 (Vol. 178, No. 21), now more than a strenuous year ago, it contains one or two points worthy of further, even late, discussion. It merits discussion despite our relative ignorance still of vasomotor control, and especially in its relation (or so I think) to the corresponding (cerebral?) quick variations in the capacity of the left heart and of the arteries.

Blood-pressure and pulse-pressure appear to be used, for some reason, in this timely and suggestive editorial, as synonyms. Technically, they mean very different things, as the writer thereof of course knew; "hyposphysia" means low blood pressure, and probably no one has ventured a Greek term for low pulse pressure, the systolic pressure at any moment less the diastolic. (A cumbersome and wholly unnecessary term, but one etymologically correct, would be *hyposphysmodunamia*.)

Very numerous hemobarograms made by my "continuous" method, varying in length from five to an hundred and twenty minutes, but mostly about thirty minutes, and on ages from five years to seventy-three, both sexes, in numerous degrees of vigor and of health (especially of mental health and disease), indicate the complete independence of pulse pressure from blood pressure. Children of health and sturdiness regularly have low levels of tension ("hyposphysia") with diastolies of 40 mm. Hg. and lower, but high contrast between the systolic and the diastolic averages: normal and infantile pulse pressure. Old persons, on the other hand, with the usual (but usually unnecessary) degree of arteriosclerosis, frequently have high arterial tensions from moment to moment, but sometimes they have low pulse pressures, because their diastolic tension is apt to be high, and their hearts relatively inefficient. Two of my records (not here shown), made from sclerotic dements at Mattapan, of 73 and 68 years respectively, however, show pulse pressures of 120 mm. Hg. and 90 mm. respectively, the diastolic in the former case being 80 by the sounds-gone

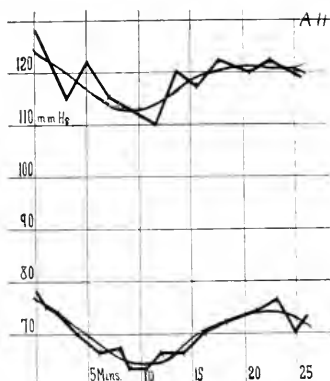


FIG. 1.—Girl, 15 years, 10 months, Forsyth Dental Infirmary for Children. The essential parallelism of the systolic and diastolic curves is sufficiently obvious, and the pulse pressure is about 60 mm. Hg. throughout, with the diastolic readings not by the newer sounds-gone method. Initial heart-rate 60, with systolic of 128 mm.; rate at end of experiment, 76, 4 p.m. In passing, the initial fall for 12 mins. is worth noting for its clinical moral, and that the diastolic curve is very unusually smooth for this age and sex. (Hemoharogram A11.)

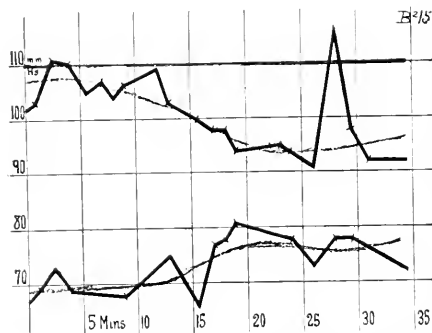


FIG. 2.—Young woman 20 years, 4 months, 3 p.m. Diastolic not by the newer sounds-gone method. Here one sees a pulse-pressure of 30 mm., or more lessened in 20 mins. to 15 mm. The rise beginning in the 25th minute, much the more marked in the systolic (as one expects at this age), was due to the recall of a recent intense grief. The heart rate at first was 83, nine minutes later, 75, and at the end, 68.

method, and in the latter case 120 mm. I am unable to explain this syndrome. The diastolic tensions of children are very much more variable, both mentally and physically, than those of adults, but none the less it is often easy to make out a pulse pressure somewhat (5 to 10 mm.?) greater than that of young adults. My records, in short, show *no correspondence* as such whatever between blood-pressure and pulse-pressure, the vasomotor control being far too various and complex to make physiological any such direct relation. Moreover, they represent very different functions in the individual.

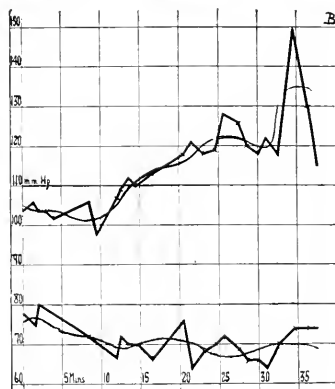


FIG. 3.—Young woman, 24 years, 3 months. This record was made after twenty minutes of athletic dancing. Starting with a pulse-pressure less than 30 mm., in 28 minutes, it nearly doubled by the movement of both the systolic and diastolic curves. The 30 mm. rise beginning in the thirty-third minute was the recall of a severe sorrow. The diastolic was made not by the newer sounds-gone method. The heart-rate at the beginning was 81; twenty-four minutes later, 72; and six minutes later also, 72.

As I demonstrated to the American Psychological Association (28 Dec., 1916), this irrelativity apparently accords especially with the *duality* of arteriotensional control. The ever-varying systolic tension represents especially the ever-changing output of the left heart, which latter is very quickly variable in size (Gesell) as well as in the frequency of its contractions. The diastolic tension is more dependent on autonomic vasomotion, direct and reciprocal. Thus the systolic variations are more mental and the diastolic more somatic and "biologic." "Arterial stuffing and constriction are very active in all persons," and respectively seem to indicate the two complementary aspects of the human personality, symbolized also in man's unique bi-stratified cortex cerebri: neopallium and archepallium. I present this as my vasomotor thesis not yet demonstrated. And vasomotion needs study.

Divergence and convergence (during an half-hour or forty minutes) of the plotted curves representing respectively the systolic and the diastolic tensions are at present under investigation in my clinical workshop. Why should the pulse-pressure sometimes progressively increase, e.g., from 26 mm. to 58 mm. in the course of 32 minutes? or decrease from 41 mm. to 13 mm. in 17 minutes, or go from 50 mm. to 16 mm. in 3 minutes, lessening later to 10 mm., the individual being a "husky" young



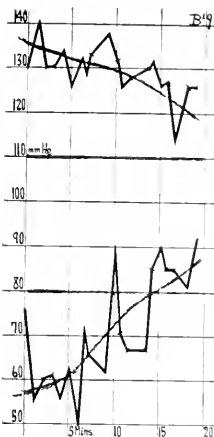


FIG. 4.—Male microceph of 19 years (mentally 1.8, Binet-Simon-Terman) Massachusetts School for the Feeble-Minded, Waverley. This hemobarogram, wholly atypical for the mentally deficient in general but typical of the lowest mental grades probably, is interesting, particularly in its diastolic part (made not by the newer sounds-gone method). A momentary pulse pressure of 87 m.m. in eighteen minutes had lowered to about 30 m.m. Heart-rate at beginning, 60; nine minutes later, 68; five minutes later, 60; and at the end, 61. (Hemobarogram B'9.)

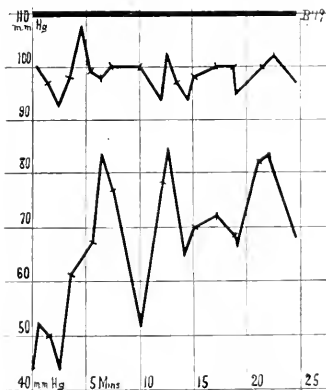


FIG. 5.—Girl 8 years, 9 months. Forceth Dental Infirmary (a Children. The alertness of this lively child is indicated by the wide diastolic variations (measured not by the newer sounds-gone method.) Starting with a pulse pressure of 50 m.m. Hg., fifteen minutes later it was about 30 m.m. The first marked rise was due to the recall of the delight of a particular violin piece (she being instinctively musical). The second was due to the recall of falling downstairs (seemingly excessively exciting until one learns that she fell three flights and was in bed for a fortnight afterward). Heart-rate at beginning, 104, and at the end, 95. (Hemobarogram 9'19.)

woman of 22.5 years, apparently in perfect mental and physical health? Each such record is a mysterious human document at present, with its interpretation to come when the alphabet is learned.

In other cases a-plenty, the two pressure-lines remain parallel to a surprising degree, despite wide variations in tension. In still other cases

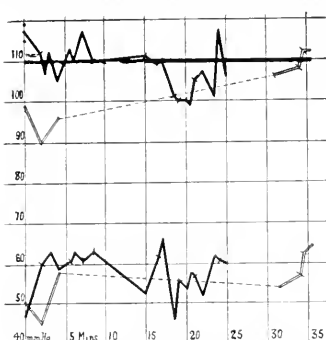


FIG. 6.—Man, 44, instructor, Harvard Summer School. Two separate hemobarograms, the solid line a month after the hollow line.

The latter shows an initial systolic averaging about 94 m.m., while the diastolics by the sounds-gone method were below 50 m.m.—in a man of this age, a few millimeters lower than the former method based on a supposed phase-change in the Korotkoff water-hammer sounds. Thirty minutes later both series were up a little. Heart-rate at beginning, 80.

The later measurements (solid line) show an early pulse pressure of about 50 m.m. The initial systolic was 15 m.m. higher than it was a month earlier although at 10 A.M., whereas the former was at 3 P.M. From the eighteenth to the twenty-second minute the effects of voluntary relaxation are shown, both curves showing some effect. The heart-rate at the beginning was 68, the subject being much more nearly normal than a month previously, nearer his attack of influenza. (See text.)

The two dots above, on the initial line, are the man's systoles, two minutes apart, six years before, showing an unusual sameness, perhaps due to his regular athletic training during this time and before. Heart-rate, 72.

all these three groups are exemplified within an half-hour, or even in less time, as the intricate business, mental and somatic, of the vasomotion demands. Each hemobarogram is unique, and each of absorbing psychologic interest in the James-Lange theory of psycho-physical relationship. Arnaistry replaces "palmistry," so to say.

Low general pressure (without regard to pulse-pressure any more) is certainly a topic in pressing need of study more systematic and deliberate than any one, so far, apparently, has given it. My own casual observations are numerous, and confirm mostly the generalizations of your editorial, with the reservations to be noted. There are a good many over-worried or over-studious young persons of each sex, but more females, whose systolic tension ranges in the nineties, and diastolic (by the sounds-gone method,—the only dependable way), in the sixties, fifties, and even forties for short periods; people without perceptible myocardial weakness or valvular leaks, and capable of a large amount of work,—some of them college athletes. In age the range of my cases is mostly between nineteen and twenty-one, largely perhaps because most of them are college and normal-school students.

Hemobarogram Fig. No. 6, however, is a physician, now 44, an athlete by training and a well-known "physical director." The hollow-line curve shows his arterial tension at 3 o'clock one July afternoon; he looked haggard and discouraged, and was distinctly worried or flustered. He had had the influenza a few months before. The solid line curve shows the same man's pressure about a month later at 10 a.m. In the twelfth minute he began a forced "relaxation," and its effects are seen for five minutes. These are the arteriotensions of an athlete in the prime of life. Perhaps the lowness of the diastolic pressures are worth noting, even if the systolic lowness is not.

It is hard to doubt that cases of which this is an example have their low arterial tension (when in a state of relative mental rest) due to some as yet undescribed syndrome of endocrines and the autonomic nervous mechanism. The posterior pituitary often is suspected. Vasomotor physiology and psychology are so new, yet so important! Only a few years ago the intricate vasomotor apparatus of the brain and cord was wholly unappreciated and the cerebrum said to have neither lymphatics nor vasomotors! Now we begin to know at least how little we understand its all-important complexities.

I wish to emphasize that most of these hypophysiatics are somehow only *functionally* wrong:—they are not "obese," not "neurasthenic," not in the "pretubercular state," and not primarily dyspeptic. They do tend to be anemic, nervous, over-worried and *flabby-muscled*. Indeed, it is quite certain that part of the lowness of their "arterial" tension is in reality the lowness of the tension of the *muscles* on which the pressure of the sphygmomanometer-cuff partly, or mostly, rests. In other words, our present method of measuring blood-pressure is most inadequate, as years ago I pointed out. It is only because blood-tension and muscle-tension are more or less generally functions of each other that the cuff-method has any indicative value at all, for muscle and fat and connective-tissue are far from being the "perfect-fluids" that the cuff-method theory, so to call it, demands. The real blood-pressure (as Brooks and Luckhardt showed) is far below the compensating pressure in the manometer, and in the cuff around the arm. Still it remains, however,

when properly adapted, the best demonstrated method devised for general practitioners' use.

Without speculating on the applied endocrinology which might cure these low tissue-tones and give them a new motor "pep" (this some day will be developed), I venture to point out that these folk need effective reëducation and fundamental regeneration above all else. Back to the active all-round life on a variously well-developed and modern hill-farm of New Hampshire or Vermont! Or secure them, say, a year or two at a good-humored school of physical education where there is plenty of music and dancing and a good mental and physical variety. Or a mountain winter-and-summer resort not dominated by molleyeoddles or by cranks. Or a jolly out-door year on an Arizona ranch.

Here following is a typical history from the research-protocols of the Sargent Normal School: Woman, 23, entered in October, 1913, obviously "anemic and run-down." Heart-rate 85; systolic blood-pressure 98; weight, 117 pounds. October, 1914, after a year of happy systematic training and theory study in the School and at Camp, "the picture of health." Heart-rate, 63; systolic blood-pressure, 106; weight, 137 pounds. Her blood's quality had developed, heart-rate lowered (as it chanced to be taken) 22, blood-pressure raised 8 mm., and her weight had increased 20 pounds—four distinct signs of basal improvement. This is a sample of a rather large group of cases which need only happy, varied, moderately strenuous life (abundant muscular exercise, fully fed, included) to make them into the best kind of "new women." When will the profession effectively learn this deep but simple lesson and the habit of applying it to these difficult cases who lack the knowledge and thought and initiative to arrange and use this native common-sense for the regeneration of their organisms? Where are drugs in comparison? or electricity? or mechanotherapy? or marriage? or mental influence?

But now we understand something of the reasons for this general young-adult debility so common in the women's colleges:—a low blood-pressure dependent on low trophic tone in the neurones, the muscles, and certain of the glands. None the less, barring heart-leaks and a rare youthful myocardial insufficiency, I am able to discern no sinister suggestion in these low pressures any more than in the slow hearts (a fe-

male case of mine, stalwart, 25 years old, had as her normal heart-rate 39 per minute), or even the young irregular hearts when due (as the slowness seems to be due sometimes) to basket-ball, or to over-strenuous muscle-work in child-hood. In the Harvard Summer School I see some of these cases year after year, have excellent opportunity to get efficiency histories, and could watch evil developments if there were any; but there are none. I am tentatively at least convinced that these three, low blood-pressure slow hearts, and young irregular hearts (like so many *bête noirs* of our medical student days: albumenuria, casts, safety-valve murmurs, ovarian cysts, functional scoliosis, deviated septums, etc.) are in many instances, perhaps in most, but effete ideas of the phobic kind. The technical details of their respective exact causes and controls will possibly before long come from the research laboratories if not from clinical guessing; but meanwhile we may safely believe that many, if not most of them, are purely functional and insignificant of serious harm.

As a corollary of all this work on the relations of mind and the autonomic vegetative mechanism: Considering the acute sensitivity of the vasomotion to emotional and to intellectual stimuli coming partly from the brain proper and partly from the endocrines, via the autonomic, it seems reasonable to expect that vasomotion will help greatly in neurologic diagnosis, in psychiatric explanation, and in mental estimation—whenever we have learned, from physiologic research, how to interpret the complex and very active and rapid reactions observed.

## THE SCARLET FEVER WAVE IN 1919.

By STANLEY H. OSBORN, M.D., C.P.H., BOSTON.

*Epidemiologist, Massachusetts State Department of Health.*

SCARLET FEVER in Massachusetts is increasing daily and more cases were reported in October this year than in any previous year. This scarlet fever wave is seen in the following table:

YEAR	AUG.	SEPT.	OCT.	TOTAL FOR 3 MOS.	TOTAL FOR YEAR
1915	274	299	439	1,012	8,613
1916	154	201	365	690	6,271
1917	145	248	410	823	5,954
1918	122	177	225	524	4,490
1919	248	407	789	1,444	5,572*

\* Ten months.

In a similar manner the deaths due to scarlet fever are increasing in number.

There had been no signs indicating the coming of an unusual amount of disease up to July, but in August, instead of the continued decrease in cases as normally occurs, there were 248 cases compared with 268 reported in July, or in other words, the disease held its own and thus secured a foothold for the winter from which to spread. It is fair to assume that the disease will increase, and increase markedly, unless educational work is carried on throughout the state against this disease.

The accompanying charts indicate the yearly incidence of scarlet fever since 1894 and the monthly incidence for the years 1915-1919, inclusive. Particularly impressive is the peak of 1914 and the constant decrease in cases the ensuing four years, with the low point in 1918. The chart showing the monthly prevalence from 1915 to date brings out one prominent fact, the high August incidence, instead of a continued decrease compared with July, as in other years.

To sum up, Massachusetts has had a decrease in scarlet fever for a four-year period, the longest time that the records have shown a continued decrease in the incidence of the disease. The result is that there is a large number of children in the State who have not had the disease and who will furnish material for a continued spread of the disease until the number of non-immune children has been greatly diminished.

### *Reasons for the Increase in Cases.*

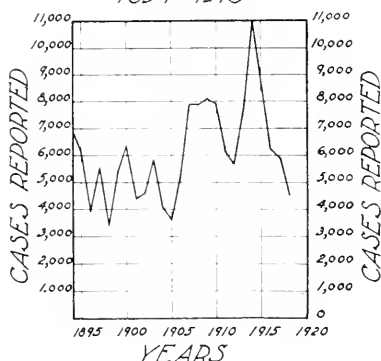
The reason for the increase is partly due to the increase in susceptible material since 1914, that is, children who have not had the disease. The year of greatest incidence in scarlet fever was 1914, when the greatest number of cases occurred in the spring months; for example, in March there were 1,717 cases reported. The present increase seems to indicate that we are to have a like increase with the largest number of cases yet to come.

Investigation this year has shown that contacts are not excluded from school in all cases and these serve as foci of infection for further spread of the disease.

Mild cases are found in school constantly and are often the chief cause of continued cases in the same school and neighborhood.

The cases are practically all among school children and the pre-school age group. The only way to control the disease is daily medi-

## SCARLET FEVER INCIDENCE IN MASSACHUSETTS 1894-1918



cal inspection at the schools in an effort to keep the school clear of mild cases of the disease. The closing of the school would tend to disseminate the disease into every part of a community instead of perhaps localizing it in a school district. Schools, where daily medical inspection of pupils can be done by a school physician or experienced public health nurse, and other public places should not be closed.

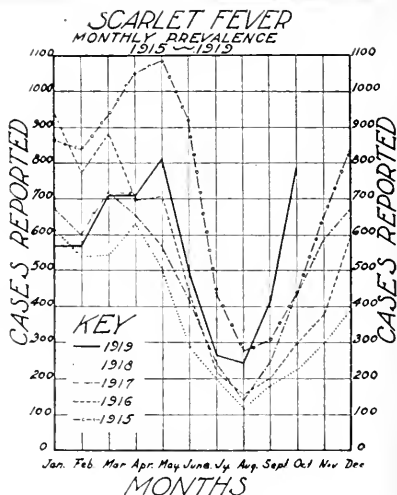
Milk is an infrequent factor in the spread of scarlet fever at the present time due to the prompt reporting of cases on milk farms and consequent action by the local boards of health. In Massachusetts, for the period 1909-14, 845 cases of scarlet fever were traced to milk as a source of infection, while for the period 1915-1918 only 140 cases have been traced to milk.

### What We Know About Scarlet Fever.

1. The incubation period is from two to five days with a maximum of eight days.

2. The infective germ, or agent, is present in the nose, throat, ear, and suppurating gland discharges for about 28 days after the onset of the average case, and on this fact the quarantine period is based.

3. As long as a sore throat or body discharges exist in a case of scarlet fever, the patient should be considered as capable of transmitting the disease. All persons who have been in contact with a case of scarlet fever may become sick at any time within eight days after the last contact with the pa-



tient as this is the maximum period of incubation for practical purposes of control of the disease.

A method of control of scarlet fever based on these facts will aid in diminishing the disease if carried out by a health board with the cooperation of the public.

### CONTROL OF SCARLET FEVER.

The control of scarlet fever is based on the detection of cases, especially mild cases, in the acute stage of the disease. On the detection of these cases rests all further public health measures such as the isolation of the case, quarantine of contacts and the epidemiological investigation into the cause of the outbreak. A community should not criticize a local board of health unless each individual assists, to his utmost, the local board of health in carrying out the necessary measures to control the disease.

1. Quarantine of the sick patient should be carried out for 28 days from the onset of the disease and thereafter until infective discharges from the nose and throat, ear and abscesses, have ceased.

2. All school children should be excluded from school for eight days after contact with a scarlet fever case, unless they are immune by having had the disease previously.

3. A daily medical inspection of schools where a scarlet fever case has appeared is the

best single method to clear a school of scarlet fever, for mild and beginning cases will be detected and proper precautions taken. The inspection should exclude from school each child who has a sore throat, a discharge from the nose or ears, suppurating glands or abscesses, and may be carried out by the school physician, or trained public health nurse.

4. The daily follow-up work by the school nurse, investigating absentees, will disclose mild cases at home who have no physician in attendance, and who because of the mild character of the disease might return to school while in the contagious stage and infect others.

5. No person should be allowed to handle milk or food after exposure to a case of scarlet fever until the maximum incubation period has elapsed or permission has been obtained from the board of health.

6. No persons whose occupations bring them into contact with children, such as a teacher who has been exposed to scarlet fever, should return to work without permission from the local board of health.

### Clinical Department.

#### CLINICAL PICTURE OF PNEUMONIA IN A BOY OF TWO WHO SUBSEQUENTLY PASSED 370 ROUND WORMS.

By WILLIAM W. McKIBBEN, M.D., WORCESTER, MASS.

This little patient was first seen at 6 P.M. Lying in bed he presented the classical picture of pneumonia:—flushed cheeks, mouth pallor, alae-nasi playing, and grunting expirations. He appeared toxic, prostrated and anxious. His pulse was 160, respirations 60, and temperature 104.

His mother had always fed him judiciously so that the only previous illness had been pertussis. A photograph taken the week before showed a fine specimen of boyhood.

However, he had been passing stringy mucus for a week or two; and the last two days had developed such a cough and cold that it culminated in his having to go to bed this afternoon. An efficient trained nurse, a friend of the family, was present and had provisionally diagnosed the case as broncho-pneumonia.

Careful percussion and auscultation over

both lungs, front and back, elicited no sonorous or harsh breathing nor any fine pleuritic râles. No Roentgen ray was taken to demonstrate a marginal pneumonia. The abdomen was tender and tympanitic.

Not finding, as yet, any positive physical signs of pneumonia, further inquiry brought out the fact that three and one-half months before, the boy had spooned some dirt into his mouth from around a shrub that had been heavily fertilized, and a week ago passed a dead worm of the *Ascaris lumbricoides* variety.

The high temperature and severe toxemia suggested the possibility of convulsions, so that besides baths and general care the nurse was ordered to give a tablespoon of castor oil, to be followed in an hour by  $1\frac{1}{2}$  grains of santonin. His gastro-intestinal tract was well prepared for the treatment as he had eaten almost nothing since morning, preferring water instead of food. At midnight an urgent call announced the coming of worms. The boy was discovered lying on his back and between his abducted thighs was a wriggling mass, pinkish in color, closely resembling earth worms. At 2 A.M., he passed a similar ball of *Ascaris lumbricoides*. The total number from these passages by actual count was seventy-eight. The writer has these preserved in alcohol. The length varied from  $1\frac{1}{2}$  to 11 inches. Those under  $1\frac{1}{2}$  inches were not counted because there were so many and the nurse did not enjoy handling them. The small ones also tapered at either end. The males averaged from five to six inches and the females from 10 to 11 inches. One worm came up from the stomach and went wriggling out of the mouth onto the pillow.

Intestinal lavage was done with four quarts of salt solution and many more worms were flushed out in this way. In the morning the nurse was found pulling them out with forceps as they appeared at the anus. The castor oil and santonin treatment was repeated morning and night, gradually reducing the amount and frequency, so that in the next two days a total of 370 round worms were brought away, not counting those under  $1\frac{1}{2}$  inches in length.

A blood analysis made on the second visit showed no leucocytosis but a marked eosinophilia of 40 per cent.

The treatment, a tablespoon of castor oil at bedtime followed by a grain of santonin in the morning, was continued bi-weekly for a month with from two to five worms resulting each

time. But an occasional treatment during the next three months resulted in no worms at all, and the boy waxed stronger and stronger until he was in perfect condition again.

### FRONTAL SINUS COMPLICATIONS.

By FREDERICK J. McVEY, M.D., BOSTON.

I WAS called in consultation on April 20, 1919, to a patient suffering from influenza, pneumonia, and a left frontal sinus, which had broken through the floor into the orbit, the left eyelid was swollen, red, and the eye could not be seen, as the eyelid remained closed.

History of the case was that the patient had received a severe blow in the left eye on March 28, 1919; also went motorcycling with only a jacket on for a distance of about 60 miles, and on April 18, 1919, took to bed. The physician in attendance called me in consultation. We examined the chest and found the characteristic signs of pneumonia; also the septic condition of the left eyelid. Nasal examination showed no pus.

I suggested an operation on the left eyelid and to do frontal sinus operation under local anesthesia, but the parents refused. One week later I was called in consultation again: the pneumonia and influenza had subsided. Again I suggested an operation and was discharged as consultant. The attending physician kept me informed daily with the case; the eyelid was later opened up and considerable pus escaped and kept draining about ten days. Then it subsided and patient became delirious, opisthotonus was present.

On May 12, 1919, the patient died. An autopsy was performed: the floor and posterior walls were found perforated, and a frontal lobe abscess was found. The reason for its perforating these walls is because the thinnest walls offer the least resistance. The microscopical finding showed streptococci and diplococci which strongly resembled the pneumococci.

DR. ELBRIDGE SIMPSON PIXLEY died at his home in Pittsfield on October 11, at the age of eighty-seven years. He was born in Great Barrington in 1832, the son of Mr. and Mrs. Luther Pixley. Dr. Pixley was graduated from the Eclectic Medical College in Philadelphia in 1878 and began practicing in Detroit in 1882. In 1890 he married Miss Henrietta E. Peet of Sandisfield. He is survived by one daughter, Mrs. Adolph Feiner of Pittsfield.

### Society Reports.

#### AMERICAN PUBLIC HEALTH ASSOCIATION. SUB-COMMITTEE ON PATHOMETRY OF THE INFLUENZA EPIDEMIC.

NOTES on meeting of the Sub-committee on Pathometry, Committee on Statistical Study of the Influenza Epidemic, American Public Health Association. Meeting held at Columbia University, Fayerweather Hall, September 19, 1919. The following were present:

Charles C. Grove (Chairman), Columbia University; Raymond Pearl, L. J. Reed, Johns Hopkins University; Otto R. Eichel, New York State Department of Health; Haven Emerson, late epidemiologist, office of the Chief Surgeon, A. E. F.; E. O. Jordan, University of Chicago; J. Arthur Harris, Carnegie Station for Experimental Evolution, Cold Spring Harbor, N. Y.; James W. Glover, University of Michigan; Arne Fisher, Prudential Insurance Company; Ellsworth Huntington, Yale University; J. Warren Smith, U. S. Weather Bureau; Edgar Sydenstricker, U. S. Public Health Service; Edwin W. Kopf, Metropolitan Life Insurance Company.

Professor Grove, in opening the meeting, said reports of progress in the tabulation of the empirical statistics of the epidemic showed that data suitable for pathometric study would soon become available. He said there were a number of basic questions which analysis should dispose of before attempting elaborate mathematical studies. He invited members of the conference to state what they considered problems of fundamental importance in order that agreement could be reached by informal discussion and resolution. The questions are set forth below, together with the consensus of opinion:

1. *Can any mathematical function rationally express the epidemic process (a) chronologically, (b) as to age incidence, (c) in relation to epidemic and endemic occurrences of diseases known as "influenza" and "pneumonia" in past years, for a particular community?*

The first conclusion of the Sub-committee was that no mathematical function, simple in nature and, therefore, practicable, could probably be found at present to express analytically

the "law" of this epidemic. This conclusion was reached after considerable discussion of the nature of epidemic data in general and the statistics of this influenza epidemic in particular. The use of the Pearsonian Type IV equation, and the equations of other frequency curves in the Pearsonian system, seemed to the Sub-committee to be undesirable so far as stating the quantitative characteristics of this epidemic are concerned. The law of an epidemic may be represented, the Sub-committee believed, only by an analytic expression which takes into account the extremely complicated cross-play of factors involved, and not by an equation representing the random distribution of the sizes of things. The Sub-committee seemed to doubt very much whether any analytic expression could be found to express the "law" of any epidemic. The fact that several functions based upon widely different hypotheses of epidemic action each gave results statistically indistinguishable from the other, convinced the Sub-committee of the need for an ultra-conservative attitude toward the mathematical statement of epidemic generalities. The epidemic process is by no means as simple as the controlled procedures of the physical and chemical laboratories. The comparative ease with which the facts of physics and chemistry are expressed analytically does not exist in epidemiology. Some light may be shed upon the higher analytics of this epidemic if epidemiologists and pathologic and sanitary bacteriologists will stipulate which of the many factors in the epidemic process are supremely important and which are not. By confining attention to a very few factors, an analytic expression for the "law" of an epidemic *may* be found, but as to this, the Sub-committee has nothing definite to offer.

II. *Shall the pandemic explosion of 1918 be studied in relation to the course of acute respiratory disease since the preceding world-wide extension of the disease known as "influenza"?*

The Sub-committee had before it the proposal that perhaps the undulations, seasonal and otherwise, of the curve for acute respiratory disease since the pandemic of 1889-1891, could be represented by a harmonic analytic function; that the experience of the autumn and winter of 1918 and the early part of 1919, was but the latest of a long series of waves, the close of a cycle of respiratory disease mor-

talidity. Although the representation of thirty years of respiratory disease mortality by means of a Fourier series seemed possible, the Sub-committee thought that such representation alone, without sound support for the proposal from clinicians and epidemiologists, would be a misapplication of the statistical method. The Sub-committee urged that the crude facts for the present pandemic period be studied intensively in relation to the mortality from acute respiratory disease during the thirty-year interval separating the two pandemics. Such study might provide the basis for an analytic expression representing a cycle of respiratory disease mortality. The conception that the invasion of 1918-1919 was not an isolated, explosive phenomenon, but was part of a chain of events leading back thirty years or more was held to be worthy of further discussion. The epidemiologists are asked to say whether they believe further analysis of the 1918 pandemic data from this angle seems justified. A full display of the earlier statistics so far as possible by month, and by sex, and age, seemed to be desirable. The Sub-committee wished to be advised by clinicians as to whether the 1918 pandemic was a distinctively different disease from that known as "influenza" in past years, or not.

III. *On "norms" of influenza-pneumonia mortality and morbidity.*

In the lack of any definite information that the symptom-complex known as influenza, and the associated pneumonias, identified in the 1918 pandemic are the same diseases as those known by the same names in past years, the Sub-committee felt that it could offer no suggestion as to a "norm" of mortality or morbidity which would have a sound philosophic basis. The Sub-committee realized that if the pandemic had not occurred, a considerable number of deaths would have been reported anyway as due to "influenza" and "pneumonia." In order to arrive at an approximate idea of the number of "excess" deaths due to the morbid influence of the new (?) disease, some attempt should be made to estimate the "expected" number of endemic so-called influenza-pneumonia deaths. An absolutely satisfactory solution of this problem was deemed to be impossible because of the clinical, nosologic and other difficulties involved. The Sub-committee finally approved tentatively the idea that an "endemic" figure be computed from

the mean annual death rate for influenza-pneumonia of as many years preceding the pandemic as practicable and properly classed according to the month and week in the calendar year, by race, sex, age, and other particulars where the data are accessible. The material used as a "norm" will depend upon the amount of detail available in historical statistical records.

#### IV. *On the disease data to be investigated.*

On the motion of Prof. Jordan, the Subcommittee considered the kinds of data to be investigated analytically. The Subcommittee was of a mind that the case-fatality of the disease had varied enormously from one community to another, and that it would be necessary to have accurate morbidity statistics of influenza and of its complications before the mortality problem of the disease could be understood. Prof. Jordan mentioned the records of low mortality for cities in the Northwest and urged that some information be published, if available, on the influence of (1) low case-incidence, and (2) either high or low case-fatality, upon the spread of the disease and upon the mortality records of these cities.

#### V. *On a study of causal relationships in influenza.*

The Subcommittee wished to caution all research students in the use of statistical devices ordinarily employed to assist in arriving at conclusions of causal relation between one phenomenon and another. It was agreed that the theory of correlation is at the present time in an unfinished condition and that any results of correlation studies be considered only as suggestions for intensive work on the part of clinicians and pathologic and sanitary bacteriologists. The correlation method in the statistics of influenza would, it seemed to the Subcommittee, be economical of research effort, because it can direct attention to the matters which it is most vital to investigate.

Because of the multitude of factors involved in the pandemic (not all of which are of the same weight, however), the method of multiple correlation was recommended as the one most likely to prove useful. A discussion of what factors the statistical analyst ought to be prepared to deal with followed. It was shown that in any phenomenon of infectious disease there were three basic elements: (1) the invading organism or group of organisms, (2) the

host, or population receiving the attack, and (3) the external environment of both invader and host. The principal facts which the analyst must bear in mind with respect to the invader are as follows:

- a The size of the dose of infection.
- b The frequency with which the dose or doses are brought in contact with the host.
- c Tendency of the invader to specific localization.
- d Infectivity of the organism or organisms (power to produce sickness.)
- e Virulence (power to produce death.)
- f Activity of invader in the presence of existing bacterial flora.

The characteristics of the host to be considered are related below:

- a Opportunity for receiving dose of infective material:  
Density of population; transport systems; public assembly; other channels of communication between the infected and the uninfected.
- b Natural and acquired immunity to invasion and multiplication of organism or organisms, and to poisons produced by the invader.
- c Resistance factors:  
Nutrition, general physical condition, fatigue status, hygiene of environment, existence of definite bodily and mental states (injuries, effects of other diseases, and intoxications, etc.), personal habits, medical and nursing care of those infected.

The third factor is the external environment of both the invader and the host. Temperature and humidity, separately and when acting together, and *changes* in the same, may be expected to have some influence upon infectious disease and especially upon respiratory and influenzal disease. By the ordinary methods of graphically associating weather and influenza-pneumonia data no very clear idea can be formed of the relation between these two elements. Students of this phase of the causal relation problem are urged to employ proper methods of measuring the combined effects of temperature and humidity, and of variations in the same. It is possible also that only accumulations of excess or deficiency of temperature and humidity from an "optimum" or



"norm" will show correlation with influenza. Some of the points to bear in mind in these correlation studies of weather and influenza data are, it seems to the Sub-committee:

- a Explosiveness or "epidemicity" of the epidemic.
- b Time distribution.
- c Aggregate of epidemic damage regardless of explosiveness or time distribution.
- d Infectivity of the organism at various stages of the epidemic wave.
- e Virulence of the organism at various stages of the epidemic wave.

As to the effect of weather conditions upon the case-fatality of the disease, the Committee recommended that, wherever possible, mention be made upon case records of prevailing weather conditions, and that such case-records be studied in relation to the various weather elements and variations in the same.

VI. *On the nature of research studies in influenza statistics.*

The Sub-committee wished to urge through its resolution that the inductive studies discussed in these notes be supplemented by deductive inquiries. Rigorous analysis, applied to reasonable hypotheses of the epidemic process, and referred from time to time to empirical facts may lead to results of value.

For the use of analysts, the following bibliography is given:

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"Theory of An Epidemic." *Proceedings*, Royal Society, Edinburgh, Vol. 26, Pt. IV., p. 484, 1906; "Certain Considerations on the Causation and Course of Epidemics," *Proceedings*, Royal Society Medicine, London, June, 1909; "Mathematical Theory of Random Migration and Epidemic Distribution," *Proceedings*, Royal Society Edinburgh, Vol. 31, Pt. II., p. 261, 1910; "Investigations into the Theory of Infectious Diseases," *Public Health*, London, Vol. 28, No. 6, 1915; "On the Curve of the Epidemic," *British Medical Journal*, May 8, 1915; "Certain Aspects of the Theory of Epidemiology" (with mathematical appendix containing review of Greenwood-Ross-Brownlee studies), *Proceedings*, Royal Society Medicine, London, May, 1918.

Evans, George H.:

"Some Arithmetical Considerations on the Progress of Epidemics," *Transactions*, Epidemiological Society, London, Vol. 3, Pt. III., p. 551, 1873-5.

Greenwood, H.:

*Journal of Hygiene*, XI., Plague Supplement, pp. 62-156.

Knibbs, George H.:

"The Theory of 'Happenings' or 'Occurrence Frequencies,'" Appendix A, p. 444, Vol. I. Census of Australia, 1911.

Ross, Ronald:

"Logical Basis of the Sanitary Policy of Mosquito Reduction," Congress Arts and Sciences, St. Louis, Vol. VI., p. 89, 1904; "Prevention of Malaria in Mauritius," Waterlow and Sans, London, 1908, p. 29; addendum on "Theory of Happenings," in "The Prevention of Malaria," J. Murray, London, 1911; "Some Quantitative Studies in Epidemiology," *Nature*, London, October 5, 1911; "Some *A Priori* Pathometric Equations," *British Medical Journal*, May 27, 1915; "Application of the Theory of Probabilities to the Study of *A Priori* Pathometry," *Proceedings*, Royal Society, London, Vol. 92, Series A, July 14, 1915, pp. 204-230.

## Book Reviews.

*Pathological Technique* (7th Edition). By FRANK B. MALLORY, A.M., M.D., and JAMES HOMER WRIGHT, A.M., M.D., S.D. Philadelphia and London: W. B. Saunders Company. 1918.

The seventh edition of this practical manual is now ready. Aside from mentioning a few points of revised arrangement, it is unnecessary to comment on the success with which the work of these authors has been met. As a helpful guide to beginners and as a handbook of reference for the experienced pathologist it has become almost indispensable to technicians. On each of its five hundred and fifty-five pages the laboratory worker will find valuable assistance. It does not attempt to explain at length a collection of intricate methods and formulae, but selects and explains carefully certain methods which have been tried and found to be of greatest practical value. One hundred and eighty-one illustrations clarify the text throughout. Among other changes in this edition the postmortem technique has been put at the end. The following additions are deserving of notice: Goodpasture's stain for frozen sections of fixed tissues and also for demonstrating metachromatically the different granules in the islet and acinar cells of the pancreas; Graham's oxidise stain for the granules in the myeloblastic series of cells and leucocytes; Benians' Congo red method for the demonstration of spirochetes; Claudius' stain for flagella; and the approved

method of classifying pneumococci with reference to serum treatment. A few new suggestions in the mechanical performance of fixing frozen sections have been added. The arrangement of subjects in this seventh edition is as follows: Histological Methods; Culture-Media; Culture Methods; Methods of Staining Bacteria; Pathogenic Bacteria and Fungi; Animal Parasites; Clinical Pathology; Post-mortem Examinations; Addenda.

*The Surgical Clinics of Chicago*, April, 1919.  
Volume 3, Number 2, with 63 Illustrations.  
Published Bi-Monthly. Philadelphia and London: W. B. Saunders Company.

This number contains the following contributions: Dr. E. Wyllys Andrews: Cholecystectomy and the Management of the Proximal Stump of the Cystic Duct; Use of Kangaroo Tendon and Spun Threads of Tendon as Substitutes for Catgut; Multiple Drilling of Fractures—An Old-Fashioned Operation Revised.

Dr. A. J. Ochsner: Fracture of Humerus; Ununited Fracture of the Humerus; Fracture of the Patella; Double Harelip and Cleft Palate.

Dr. Truman W. Brophy: Harelip.

Dr. Carl Beck: Multiple Papillomata of Bladder; Syphilis of the Stomach—Resection of Pylorus for Impermeable Luetic Stricture; Restoration of Cheek following Extensive Resection for Carcinoma.

Dr. Carl B. Davis: Plastic Repair of Deltoid Muscle; Recurrent Dislocation of the Patella.

Dr. Thomas J. Watkins: A Plastic Operation for Constriction at the Vaginal Orifice and for Vaginismus; Carcinoma of the Cervix Treated by Radium and Hysterectomy.

Dr. Arthur Dean Bevan: Appendicitis; Appendiceal Abscess; Carcinoma of the Cecum; Amputation at Middle of Thigh for Gas Gangrene; Abscess of the Lung; Congenital Pyloric Stenosis; Carcinoma of the Larynx.

Dr. Franklin B. McCarty: Fracture of the Carpal Scaphoid.

Dr. Victor L. Schrager: A Suggestion in the Technic of the Radical Operation for Carcinoma of the Breast; Routine Appendectomy Through Right Indirect Inguinal Hernia Sac in Afebrile Cases; Syphilis of the Liver Simulating Gall-Bladder Pathology.

Dr. Benjamin F. Davis: Winged Scapula—Serratus Magnus Palsy.

Dr. William Hesser: Ununited Fracture of Neck of Femur—Treatment by Bone Transplantation.

Dr. Edward L. Moorhead: Prolapse of Uterus in a Virgin Eighteen Years Old; Congenital Inguinal Hernia; Strangulated Inguinal Hernia Complicated by Acute Gangrenous Appendicitis; Infantilism.

Dr. G. L. McWhorter: Diagnosis of Fistula in Ano.

Dr. Daniel M. Eisendrath: Fractures of the Patella.

Dr. Gatewood: Strangulated Epigastric Hernia.

Dr. Emmet A. Printy: Postoperative Diphtheric Infection of a Hernia Wound.

Dr. Robert H. Herbst: Severe Hematuria—Excision of Malignant Tumor of Bladder; Prostatectomy for Hypertrophy of Prostate Gland; Extensive Stricture of the Urethra; Bilateral Colon Pyelitis with Cystitis; Vasotomy in a Case of Persistent Seminal Vesiculitis.

The reviewer calls special attention to Dr. Bevan's thirty-page article on Appendicitis; also to Drs. Ochsner's and Eisendrath's chapters on operation for fracture of the patella; both men recommending early mobilization and use of the leg (ten to sixteen days after operation), and one (Ochsner) not using any splint at all after operation.

The illustrations are, as usual, excellent.

*Personal Identification.* By HARRIS HAWTHORNE WILDER, Ph.D., and BERT WENTWORTH, Boston; Richard G. Badger—The Gorham Press. 1918.

Up to the present time the idea of positive methods of identification has been almost universally associated with criminals and finger prints. Such a system has proved an invaluable aid to the governments of the world in running down certain individuals. However, there are countless other cases where proof beyond doubt must be established that a person or a dead body is the one sought. The need is present in schools, hospitals, and more especially now, in time of war, when there is a great need of definitely identifying each soldier and sailor. This book incorporates all the known methods of personal identification, including the system of measurements of M. Bertillon, the famous system of finger prints devised by Sir Francis Galton and effectively put to use by Sir E. R. Henry of Scotland Yard, and introduces two new methods: (1) by the palms, and (2) by the soles. The treatment of these two methods is adapted for self-instruction. This volume is an attempt on the part of the authors, one a professor of zoology and the other a former police commissioner, to show what has been accomplished in the past and what the possibilities are for the future in this sort of work. As a scientific work it is a particularly interesting discussion of the variability of personal characteristics of the body. It is fascinating reading and contains marvelous examples of the exact workings of positive identification. The illustrations carry the reader from historical methods up to present-day methods, and the book itself is divided into two parts: Part I—Methods which furnish partial identification, and Part II—Methods which furnish absolute identification.

# THE BOSTON Medical and Surgical Journal

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ERNEST GREGORY, *Manager*

126 Massachusetts Ave., Corner Boylston St., Boston, Massachusetts.

## CONSTITUTIONAL FOUNDATIONS OF PUBLIC HEALTH FUNCTIONS.

EVER since the adoption of the Constitution by the United States there has been a tendency for the transference of power from the states to the National Government. Of late years the assumption of leadership by the government in matters relating to the public health has been more pronounced, and with the formation of the National Department of Health will, no doubt, become even more so.

These powers have not been specifically delegated to the central government by the Constitution. The process of their gradual assumption is an interesting study, especially from the point of view of the gradual disuse and resulting atrophy of the once vigorous "States' Rights."

President Goodnow of Johns Hopkins University, addressing the Conference of State and Provincial Boards of Health last June, traced

this process and showed by what authority the Federal Government had taken on these powers. The extent of power possessed by the National Government, he said, depended upon two important principles. These might be summarized by the statement that the National Government, although of enumerated powers, is supreme in the exercise of the powers enumerated.

No power over the public health is granted by the Constitution to the Federal Government. Power is granted, however, to make all laws necessary and proper for carrying into execution any of the powers vested by the Constitution in the Government of the United States or in any department or officer thereof. President Goodnow finds that there are two general clauses of the Constitution under the provisions of which the central government is enabled to attack problems relating to the general health. The first is the power to regulate commerce with foreign nations and among the several states. This power was at first interpreted very narrowly but as the states became less jealous of their rights it became amplified until it enabled the central government to put through successfully as radical a measure as the Pure Food and Drug Act. An attempt to stretch the power still further, as exemplified by the Child Labor Act, was judged unconstitutional by the Supreme Court, on the ground that the Act was an attempt to regulate methods of manufacture within a state, and that these were a matter for state and not for national regulation. In other words, the Acts of Congress based on the clause of "Regulating Commerce" must have something to do with interstate transportation.

The second great source of national power with regard to the public health is to be found in the power granted by the Constitution to Congress to "lay and collect taxes, duties, imposts and excises, to pay the debts and provide for the common defense and general welfare of the United States."

"The power to tax is the power to destroy." By prohibitive taxation Congress may make it practically impossible to manufacture certain articles. An example of this is the prohibitive tax on the manufacture of phosphorous matches. By this clause Congress has also given the power to appropriate money to "provide for the common defense and general welfare of the

United States." This justifies a large proportion of the activities of the National Health Service. It does not, however, authorize the United States Government to interfere with the sanitary work of the several states except by their consent.

There is no doubt but that these delegations of power to the central government are in line with the people's wishes. Public health is becoming more and more a matter of national and even of international concern. It is not unlikely that the next few years will see far greater steps in the assumption by the National Government of power over the health of the people.

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### SAFE-GUARDING THE HEALTH OF STUDENTS.

THE man who graduated from one of our older universities in the days when rooms were heated only by dusty open fires, when the toilet facilities provided for the necessary, not for the aesthetic, and when no one ever told the undergraduate how often he should bathe, would be amazed at the plans for student hygiene which are now being carried out in many of our colleges and universities.

A good exposition of such a campaign for the health of students is given by Sundwall in the U. S. Public Health reports for November 7, 1919. The scheme so described provides that the health service be divided into three main divisions: (a) personal attention; (b) sanitation; (c) education. The division of personal attention is concerned with the physical examination of students, with the supervision of their exercise, and with the problem of keeping them in the best possible health. It aims to protect the physically sound student by the early detection of communicable disease, and by the quarantine of those having such diseases. It is concerned with the reclamation and reconstruction of physically defective individuals, and with the care and treatment of all students who are ill.

The division of sanitation, obviously, has charge of the students' environment. Such matters as the regulation of temperature and humidity of dormitories and the cleanliness of baths and toilets come within the jurisdiction of this department. These duties Sundwall would depute to an officer of the faculty re-

siding in the dormitory over which he is to exercise supervision. Another suggestion is that rooming houses be rated according to a definite scale, so many points being allowed for ventilation, lighting, heating, cleanliness, and so forth.

This program is highly commendable, and will no doubt give the student many ideas as to hygiene which will prove of value in later life. The new conception of hygiene for students shows in many ways the influence of the era of mobilization and militarization through which we have just passed, and will, no doubt, for that reason, be accepted in a more kindly spirit by the "thoughtless sophomore."

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### MEDICAL NOTES.

**DRUG PRICE CHANGES.**—The following report of drug price changes was issued on October 29: It is estimated that more than \$3,000,000 worth of essential oils is tied up by the longshoremen's strike. Many products are becoming scarce. Oil of lemon, oil of cloves, oil of citronella, oil of orange and others are higher. Even the lifting of the strike embargo will not lower prices on these imported oils because of the many unfilled orders and the fact that the insurance charges which have accumulated must be paid by buyers eventually.

The drug market is also seriously affected by the dock strike, one of the largest manufacturers of quinine having a cargo of cinchona bark held up in New York harbor for weeks, with small prospect of its release for weeks to come. The available quinine is running short, and the situation will become serious if an epidemic of influenza starts. Many other crude drugs are extremely scarce owing to the strike embargo, and the trade is anticipating higher prices on this account.

Coal-tar intermediates are in good demand, especially stocks for spot delivery. Aniline oil is scarce and held in isolated lots. Very little business for 1920 delivery is being closed, owing to the uncertain conditions. The output of benzol is increasing. Logwood and hematine are higher. Colors are in demand, many important types being scarce. Victoria Blue B is very strong, and auramine single and double O are in short supply.

Orders for vegetable oils and animal oils are limited, but first hands are holding prices firm.

second hands are offering material more freely and are shading prices in efforts to unload. Producers say stocks are not large, and with renewed buying demand they expect higher levels for many products. Linseed oil is lower for future delivery, and menhaden declined slightly.

**YELLOW FEVER IN NICARAGUA.**—A recent report states that as several cases of yellow fever have developed at Corinto, Nicaragua, a quarantine has been placed on all steamers coming from there by Guatemala.

**RED CROSS AID IN SIBERIA.**—At the request of Admiral Kolchak, the American Red Cross has undertaken to establish and administer quarantine stations along the Trans-Siberian Railroad in an effort to stamp out typhus, which is spreading at an alarming rate. Colonel Rudolph Palling Teusler, who is in charge of the Red Cross work in Siberia, has secured co-operation between the Russian civil and military authorities, the latter assuming the burden of maintaining not only proposed quarantine stations, but hospitals already established as well. Ten thousand beds have been made available in Russian hospitals by Colonel Teusler, in addition to nine hospitals with thirty-eight hundred beds under the management of the Red Cross.

**APPOINTMENT OF DR. J. G. FITZGERALD.**—Dr. J. G. Fitzgerald has been appointed professor of hygiene at the University of Toronto. He has been associate professor of hygiene in that institution, and is also director of the Connaught Antitoxin Laboratories. Dr. Fitzgerald is to succeed Dr. John A. Amyst, who has been appointed deputy minister of health in the Federal Department of Health, Ottawa.

**LETHARGIC ENCEPHALITIS.**—A number of cases of the disease called by the name of lethargic encephalitis have been reported recently in different parts of the country. A *Public Health Report* which was issued in February has described the disease and mentioned the cases which have been observed. Attention was called to this malady in April, 1917, at a meeting of the Vienna Psychiatric Society, when Von Economo described a number of cases which had occurred in epidemic form. In May, 1918, the disease was discussed by the

Paris Academy of Medicine, where the opinion was expressed that lethargic encephalitis is not a form of poliomyelitis. It is believed that the disease was observed several hundred years ago. There is evidence that it appeared in Italy and Hungary in 1890, in European countries and in the United States five years later, and in Vienna in the winter of 1916-17. The first case reported in England appeared in February, 1918, and was made notifiable in England and Wales. The disease continued until June, with a maximum weekly incidence of eighteen.

From what has been observed about lethargic encephalitis it appears to be an acute, infectious disease, probably due to a specific virus, finding entrance to the body through the nasopharynx, and attacking various sections of the nervous system. Little has been definitely concluded as yet from bacteriological study. Seven types have been differentiated by clinical observation. The majority of cases are characterized by a stupor lasting from two or three days to a number of weeks. The mortality from this disease is high, and convalescence often requires about six months. No specific treatment has been recommended.

**ANTHRAX.**—An investigation conducted by two members of the United States Public Health Service and reported in a recent issue of the *American Journal of Public Health* shows that this is an infection which should be given more serious attention. In 1916 there were reported 106 cases from nine states, and in 1917, 202 cases from fifteen states. There has been a mortality rate of thirty-three per cent. of the cases. In Massachusetts there were 54 cases with 11 deaths; in New York, 32 cases with 12 deaths; and in Pennsylvania, 25 cases with 11 deaths. Since manufacture has been greatly stimulated during the last year, the statistics for 1918 are awaited with interest.

### The Massachusetts Medical Society.

#### PUBLIC HEALTH CONVOCATION.

THE third Convocation on Public Health arranged by the Committee on Public Health of the Massachusetts Medical Society was held at Springfield, November 21 and 22 with the following program:

## FRIDAY, NOVEMBER 21

S. P. M.

## Opening Session

ADDRESSES OF WELCOME FROM *Dr. Enos H. Bigelow*, Chairman of the Committee on Public Health; *Dr. Alfred Worcester*, President of The Massachusetts Medical Society, and *His Honor, Arthur A. Adams*, Mayor of the City of Springfield.

THE HEALTH OF THE COMMONWEALTH. *His Excellency, Hon. Calvin Coolidge*, Governor of the Commonwealth.

BETTER HEALTH IN MASSACHUSETTS. *Dr. Eugene R. Kelley*, State Commissioner of Health.

THE PROGRAM OF THE INTERNATIONAL HEALTH BOARD. *Dr. Victor G. Heiser*, Director for the East, International Health Board.

## SATURDAY, NOVEMBER 22.

MORNING

## Session on Personal and School Hygiene.

10.05 PERSONAL HYGIENE THE BASIS OF HEALTH. *Professor W. T. Sedgwick*, Head of the Department of Biology and Public Health, Massachusetts Institute of Technology.

11.05 THE DENTAL CARE OF SCHOOL CHILDREN. *Dr. George H. Wright*, Lecturer on Dental Hygiene, Harvard Dental School.

12.05 ESSENTIALS OF SCHOOL HYGIENE. *Dr. Walter H. Brown*, Health Officer, Bridgeport, Conn.

## SATURDAY, NOVEMBER 22

AFTERNOON

## Session on Industrial Hygiene

2.05 INDUSTRIAL HEALTH. *Dr. Cecil K. Drinker*, Secretary of the Governing Committee on Industrial Hygiene, Harvard Medical School.

3.05 PUBLIC HEALTH NURSING IN AN INDUSTRIAL COMMUNITY. *Miss Mary Beard*, Director of the Boston Instructive District Nursing Association.

4.05 GOOD AIR AND THE HEALTH OF THE WORKER. *C. E. A. Winslow, D.P.H.*, Professor of Public Health, Yale University Medical School.

## SATURDAY, NOVEMBER 22.

S. P. M.

## Final Session.

THE ESSENTIALS OF AN ADEQUATE DIET. *Alice F. Blood, Ph.D.*, Head of the Department of Household Economics, Simmons College, Boston, Mass.

LESSONS FROM THE FRAMINGHAM HEALTH EXPERIMENT. *Dr. P. C. Bartlett*, Chief Medical Examiner, Community Health and Tuberculosis Demonstration, Framingham, Mass.

RURAL SANITATION IN THE NORTH AND SOUTH. *C. W. Stiles, M.D.*, U. S. Public Health Service, Washington, D. C.

THE RELATION OF FEEBLEMINDEDNESS TO PUBLIC HEALTH. *Dr. Walter E. Fernald*, Superintendent, Massachusetts School for Feeble-minded.

This was the first meeting of the sort to be held in the western part of the state and was attended with a high degree of enthusiasm. Public health workers and town and city officials from the Connecticut Valley district attended in large numbers. The special sessions on School and Industrial Hygiene were of particular value to people engaged in these fields of public health activity.

The list of speakers cited in the above program speaks for the quality of the addresses delivered. The general sessions on Friday and Saturday evenings were specially well attended

and the whole affair was made extremely pleasant by the cordiality and enthusiasm of the medical profession and the public health workers in the Springfield district. The Committee on Public Health and the cooperating organizations are to be congratulated on its success. The members now serving on this committee are *Dr. Enos H. Bigelow* of Framingham Center, *Dr. Roger I. Lee* of Cambridge, *Dr. E. F. Cody* of New Bedford, *Dr. Victor Safford* of Jamaica Plain, and *Dr. Annie Lee Hamilton* of Boston.

## SOCIETY NOTICES.

NEW ENGLAND PEDIATRIC SOCIETY.—The forty-ninth meeting of the New England Pediatric Society will be held at the Boston Medical Library on Friday, Dec. 12, 1919, at 8.15 P. M.

## PROGRAM.

1. Treasurer's report.
2. The report of the Council.
3. The following papers will be read:
  - (a) The Fundamental Basis of Nutrition. *Fritz B. Talbot, M.D.*, Boston.
  - (b) The Work of a Nutrition Class (Illustrated by slides). *W. R. P. Emerson, M.D.*, Boston.
  - (c) Bodily Mechanics and Nutrition. *Lloyd T. Brown, M.D.*, Boston.
4. The election of officers.

*WILLIAM E. LADD, M.D., President.*  
*RICHARD M. SMITH, M.D., Secretary.*

HAMPSHIRE COUNTY BRANCH OF THE MASSACHUSETTS MEDICAL SOCIETY.—The next meeting will be held at the Forbes Library, Northampton, on Thursday, Dec. 4, 1919, at 11.30 A. M. *Dr. Joel E. Goldthwait* of Boston, will talk on "Some of the Lessons Learned as a Result of the War Activities Which Should be of Value to the General Practitioner." It is especially desired that all members make an urgent effort to be present to hear *Dr. Goldthwait*, whose valuable military services are well recognized.

*P. N. THOMAS, M.D., Secretary.*

SUFFOLK DISTRICT MEDICAL SOCIETY.—A meeting of the Surgical Section was held on Friday evening, November 21, at the Medical Library. *Dr. Edward L. Keyes, Jr.*, of New York, read a very interesting paper on "Prostatism."

## NOTICES.

THE CUTLER LECTURES ON PREVENTIVE MEDICINE, by *T. M. Legge, M.D., D.P.H.*, His Majesty's Inspector of Factories and Lecturer on Factory Hygiene, University of Manchester, London, England, will be on the following subjects: Monday, December 8, "Twenty Years' Experience of the Notification of Industrial Diseases under the Workmen's Compensation Act;" Tuesday, December 9, "Medical Supervision in Factories;" Wednesday, December 10, "Industrial Diseases under the Workmen's Compensation Act." The lectures will be given at the Harvard Medical School amphitheatre, Building E, from 5 to 6 P. M.

These lectures are given annually under the terms of a bequest from *John Clarence Cutler*, whose will provided that the lectures so given should be styled the Cutler Lectures on Preventive Medicine, and that they should be delivered in Boston, and be free to the medical profession and the press.

All members of the classes in the Medical School, the medical profession, the press, and others interested are cordially invited to attend.

# The Boston Medical and Surgical Journal

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## The Massachusetts Medical Society.

### MEETING OF THE SECTION OF MEDICINE, JUNE 3, 1919.

#### THE TRANSMISSION OF INFLUENZA.

By J. P. LEAKE, M.D., WASHINGTON, D. C.,

*Passed Assistant Surgeon, U. S. Public Health Service,  
Hygienic Laboratory, Washington, D. C.*

THE human experiments on the transmission of influenza at Gallops Island, Boston Harbor, during February, 1919, were in continuation of earlier experiments at San Francisco and at Boston, during November and December, 1918. These earlier experiments have been summarized in brief in the Public Health Reports for January 10, 1919. The San Francisco experiments were under the charge of Surgeon G. W. McCoy of the United States Public Health Service and Lieutenant De Wayne Richey of the United States Navy Medical Corps. The volunteers were enlisted men of the Yerba Buena Naval Training Station who had not been exposed to influenza during the autumn epidemic. They were transferred to the Angel Island Quarantine Station, San Francisco Harbor, for the experiments. On different groups of these volunteers

various materials were used, with entirely negative results as regards the production of the symptoms of influenza. Several men received a heavy suspension of eight strains of Pfeiffer's influenza bacillus, unfiltered, into their nostrils; the same number received the same material after passage through a Berkefeld filter to remove the bacteria. A considerable number of men received the secretions from the upper respiratory tract of active cases of influenza fifteen to forty-eight hours after onset, instilled into their nostrils three or four hours after collection; in about half these cases the material was unfiltered and contained Pfeiffer's bacilli, group four pneumococci, and hemolytic streptococci; the others received the same material after passage through a Berkefeld filter. Similar filtered material was dropped into the conjunctival sacs of two volunteers and injected subcutaneously into another volunteer. One man received subcutaneously one cubic centimeter of blood from an influenza patient. As just stated, all these inoculations were without result as regards the production of influenza. The only clinical effect was an acute tonsillitis, apparently due to a hemolytic streptococcus, in three of the volunteers who received unfiltered secretions in their nares.

The November Boston experiments were under the direction of Lieutenant Commander M. J. Rosenau and Lieutenant W. J. Keegan, Medical Corps, United States Naval Reserve Force, and of Surgeon Joseph Goldberger and Assistant Surgeon Gleason C. Lake, United States Public Health Service. The volunteers were from the Deer Island Naval Detention Training Camp and were not free from prior exposure to influenza during the epidemic. They were transferred to the Gallops Island Quarantine Station for the experiment. Sixteen of the men received in their nares various strains of Pfeiffer's influenza bacillus, some recently isolated from cases of influenza. Thirty received in their nose and throat, by spray and swab, the secretions from the upper respiratory tract of typical cases of influenza; for part of these inoculations the secretions were filtered; in other cases the time from donor to recipient was less than 30 seconds. Ten of these same volunteers were intimately exposed for forty-five minutes to a series of ten cases of epidemic influenza from ten to eighty-four hours after onset, the sick men talking with and coughing into the faces of each of the volunteers. Ten other volunteers received subcutaneously the filtered secretions from five cases of influenza, and ten others received subcutaneously the pooled blood from the same five cases of influenza, less than forty-five minutes after withdrawal.

The results of all these experiments, with the Pfeiffer bacillus, with secretions, with direct exposure, with subcutaneous inoculation of filtered secretions and unfiltered blood, were entirely negative.

This startling result, apparently in direct contradiction of our usual ideas on the manner of spread of the disease, demanded further investigation if the opportunity could be obtained, and fortunately another set of volunteers offered themselves. The two parties of investigators combined for this third trial. The writer was added to the group, and much help was obtained from Lieutenant Commander L. W. McGuire and Lieutenant W. R. Redden of the Naval Medical Corps. We are particularly indebted to Passed Assistant Surgeon W. M. Bryan, of the Public Health Service, for constant sympathetic coöperation. Acknowledgments are also due Captain John M. Edgar, Commander F. M. Furlong, Lieutenant A. L. Grant, Lieutenant Parsons and Lieutenant T. J. Kennedy of

the Naval Medical Corps, Acting Assistant Surgeons F. X. Crawford and E. M. Looney of the United States Public Health Service, Dr. Harry Linenthal, Professors Reid Hunt and Worth Hale of the Harvard Medical School, beside the donors and recipients in the various experiments.

The volunteers, as before, were from the Deer Island Naval Training Station. Two gave a history of a prior attack of influenza during the epidemic, eleven others had been in close contact with cases of the disease, twelve had casual contact, and nineteen gave no history of exposure to the 1918-1919 epidemic. They were transferred to Gallops Island and kept isolated, under daily observation, for a week before the beginning of the experiment. Those who appeared to be unsuitable during this preliminary observation and physical examination were returned to Deer Island. Temperature curves, blood counts, and Schick reactions were recorded for each volunteer, beside the bacterial flora of the nasopharynx before and after each experiment. Similar observations, except the Schick test, were made on the donors. It may be said at once that there was no relation between the reaction to diphtheria toxin and the susceptibility to tonsillitis or influenza. The opposite condition was found true for poliomyelitis by Zingher<sup>1</sup>—that is, the children who were attacked by poliomyelitis were found to give a much higher percentage of positive Schick reactions, indicating susceptibility to diphtheria, than the average for the same ages.

During each experiment, the members of the group undergoing experiment were isolated from the other volunteers. By making use of the hospital facilities of the quarantine station it was possible to have four such groups isolated simultaneously.

The experiments with Pfeiffer's bacillus were repeated, this time using a strain of known virulence for mice. One-tenth cubic centimeter of the culture containing five billion per cubic centimeter was fatal to white mice of 20-gram weight in 48-hours. This culture was combined with a staphylococcus culture suspended in broth and instilled into the nose and throat. The nasal and pharyngeal secretions of three of these volunteers were alkalinized with a 4 per cent. solution of sodium bicarbonate before the experiment. Three others received one-half per cent.



acetic acid, changing the reaction in the opposite direction, and the remaining four received the instillations without preliminary injection. There was no result from this experiment except a transient tonsillitis in one of the recipients, five days after the inoculation, without significant change in the flora of the throat.

Micrococci of the group found by Mathers as very frequent in the respiratory tract of influenza patients were similarly inoculated without result.

The unfiltered pharyngeal and nasal secretions of a patient twenty-two hours after the onset of what appeared to be a mild attack of typical influenza were instilled into the nose and throat of ten volunteers. One of these developed a mild exacerbation of a subacute tonsillitis three days after inoculation, his throat culture showing the same organisms as before.

One other of the ten (F.W.B.), five days after inoculation, developed symptoms hardly distinguishable from an attack of influenza, with fever, headache, backache, congestion of the fauces without tonsillitis, loss of appetite, chilly sensations, and cough. The leucocyte count, however, remained about 10,000 to 13,000, while it was 8,400 before inoculation. The temperature reached 101.3° on the first day, 100.5° on the second, 102.3° on the third, and 100.4° on the fourth day. Two days after onset an attempt was made to transfer the disease from this man to ten other volunteers by the same method of inoculation, but without result. This case, therefore, remains as a possible instance of artificial transmission of influenza by the nasopharyngeal inoculation of secretions from an early case of the disease, with an incubation period of five days.

A sudden outbreak of 215 cases of influenza among the 2200 inmates of the Portsmouth Naval Prison furnished donors for other experiments. Two groups of four volunteers each were taken to the prison in closed automobiles and kept isolated except for the inoculations. One of the groups received the nasopharyngeal washings (in Loeke's solution) from very early cases of the disease—five hours after onset in two instances. Each volunteer had ten cubic centimeters of the washings instilled into his nose and throat by spray and dropper, and swallowed 25 cubic centimeters of the washings mixed with 250 cubic centimeters of milk. The other group of four received similar washings

from ten prisoners who had been in recent contact with cases of influenza, as an attempt to secure transmission during the incubation period. None of these ten donors developed typical influenza, and the inoculation was without result. Two of the first group of four, on the other hand, had acute follicular tonsillitis beginning forty hours after inoculation, and in all four a strongly hemolytic streptococcus became the predominating organism in the throat. One of these cases of tonsillitis, with no leucocytosis, so much resembled influenza nine hours after onset that transfer was then made of his secretions to ten more volunteers.

In all of these ten, with one exception, the strongly hemolytic streptococcus became the predominating colony, and five of the nine developed acute follicular tonsillitis about two days after inoculation. This other volunteer (S.), five days after inoculation, suddenly began to have a headache, fever, prostration, a cough, and pains in the back. His face was flushed and his fauces and conjunctivae congested; photophobia became prominent. His leucocytes dropped from 10,000 before inoculation to 6,000, 4,000 and 5,000 during the fever. At first his nasopharyngeal bacterial flora were not much altered, but after several days of sickness, Pfeiffer's bacillus began to be the predominant organism. After a few days the temperature, which had reached from 100.2° to 103.8° each day, fell, but the prostration was still marked, and the cough and expectoration were very slow in clearing up. This appeared, therefore, to be a case of influenza. The donor from whom the patient was inoculated apparently had an acute follicular tonsillitis due to the hemolytic streptococcus (beta type) though he had in turn received secretions from true cases of influenza.

Another set of ten volunteers received the secretions from an uncomplicated case of influenza four hours after onset. All of these remained well except one (L.J.), who after 36 hours began to have fever, pain in the back and chest, cough, and anorexia. His fauces became red and photophobia was troublesome. His white blood cells fell from 10,000 before inoculation to 9,000 the day of the onset, and 4,500 later during the attack. The temperature was between 101.3° and 103° for 48 and then fell to 99.5°. Two days later the pulse rate was only 60 per minute. The same bacteria were present

after as before inoculation, but instead of the hemolytic streptococcus being predominant as at first, only one colony of this organism was found on the plate made 24 hours after onset, its place being taken now by the Pfeiffer bacillus, which was second in importance before inoculation. Recovery from the attack took place in five days: the fever lasted only sixty hours. Fifty-four hours after onset, an attempt was made to transfer the infection by means of secretions to the final group of fifteen volunteers, but without success. In five of the fifteen, however, the hemolytic streptococcus became the most numerous colony, and three of the five developed acute tonsillitis.

In drawing conclusions, the uncertainty of the diagnosis of influenza in single cases must be borne in mind. However, it appears from our experiments that influenza is transmissible by means of the nose and throat secretions of persons suffering from the disease, with the nose and mouth as portals of entry, but that such transmission is far from a uniform result of such exposure: the first 24 hours of the disease were the most favorable for this transmission. The customary measures for prevention are therefore reasonable.

The conduct of human experiments bears the double responsibility of securing facts of value to the human race and of avoiding any unnecessary injury to those who have yielded their bodies to the service of others. When we read the report of Walter Reed, Carroll, Agramonte, and Lazear, the paucity of our results is humiliating, but we were fortunate to have no more serious cases of illness than the tonsillitis and influenza just mentioned. Despite these illnesses, the average weight of the volunteers was slightly more on discharge than at the beginning of the experiments.

In contrast to the difficulty and rarity with which influenza was transmitted is the comparative ease and frequency with which tonsillitis appeared in those inoculated, even though the donors had no tonsillitis. The development of the tonsillitis was in almost all cases associated with the predominance of the hemolytic streptococcus, type beta, in plates inoculated from the throats of the patients.

In the February experiments no attempt was made to transmit influenza by filtrates in spite of the Tunis experiments of Charles Nicolle and Lebailly reported at the Paris Academy of Sci-

ence last October. Reproduction of such a disease as influenza in dumb animals must be dubious and we have no data as to the degree of isolation of Nicolle's human volunteers. At the next weekly session Dujarrie de la Rivière reported a positive subcutaneous inoculation on himself, using filtered serum, but without controls. Selter's experiments on himself and his assistant at Königsberg, reported in the *Deutsche Medizinische Wochenschrift* for August 22nd are quite inconclusive. Filtrates were used for nasal and throat inoculation, but there was no isolation and the fever was slight or absent. Paraf and Goubault reported before the Paris Société Médicale des Hôpitaux at the last January meeting a repetition of Nicolle's technique, but using well-isolated volunteers, and controlling the experiment with unfiltered material. The filtrates, introduced into the posterior pharynx or under the skin, did not give rise to influenza, while two of the same volunteers receiving the unfiltered secretions in their throats, after an inoculation period of two and three days respectively, had headache, fever, and rhino-pharyngitis, which was diagnosed as influenza. The monkey experiments of Gibson, Bowman and Connor, reported in the *British Medical Journal*, December 14th, are quite inconclusive. They also used Nicolle's technique, and the interpretation of illness in monkeys is open to the same objection. Still more recently, Sir John Rose Bradford, and Captains Bashford and Wilson have briefly summarized their work on filter-passing viruses in a number of diseases including influenza (*British Medical Journal*, February 1st, 1919, also *Lancet and Journal of the Royal Army Medical Corps*). This influenzal work deals with cultures of a coccuslike body less than half a micron in diameter, and with its inoculation into guinea-pigs and monkeys. Without human experiments, the identity of the disease produced must be open to serious question.

The entirely negative results in our experiments with Mathers' coccus and with the Pfeiffer bacillus appear to offer some ground for doubting any causal relationship between these organisms and the disease influenza, but in view of the paucity of positive results with direct inoculation of secretions, no conclusions are justifiable from this work alone. As with the filterable virus, the verdict is simply "not proven." The green-producing diplo-strepto-

coccus of Mathers<sup>2</sup> seems to be similar to that found by Rosenow<sup>3</sup> in Rochester, Minnesota. With regard to the Pfeiffer bacillus, plates from the naso-pharynx showed this organism present in the healthy men very frequently before inoculation as well as after. In two of the cases which were apparently influenza, it became the predominating organism at some time during the illness.

Aside from offering some justification for our usual attempts to prevent influenza by diminishing the opportunities for human contact, these experiments may, we hope, suggest further work toward the solution of the problem of infection and immunity, and in particular, toward determining why an infection which in nature appears to be most facile in transmission, under apparently favorable conditions has been so difficult to transfer.

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## DISCUSSION.

DR. ALFRED WORCESTER, Waltham: I have had very little experience with it, and what I had was in Switzerland. Last summer in July the epidemic was bad enough there; in November it was a great deal worse. In the week after the armistice the Bolsheviki took possession of some parts of Switzerland and of the city of Zurich where I happened to be. The city government took refuge in the barracks. The Government of Switzerland was only able to take care of itself by mobilization of its whole army, and that brought into Berne, a city of 60,000 people normally, a division of 25,000 troops. It was cold and raw, and there were not barracks enough for shelter even with the use of school-houses and the churches. At the end of seven days there were 2,500 of those men, one tenth of the division, flat on their backs with the flu. They were lying on their blankets perhaps, if they were so fortunate as to have them, perhaps on their overcoats, in the hallways of the public buildings and in the churches, and there they died—400 of the 2,500 within the next week.

The disease spread somewhat to the civil population. Of course, the members of the different embassies were scared blue. The Swiss physicians were pouring in medicine at a tremendous rate and giving heart stimulation from the very first, but their patients were dying so fast that one could hardly make up his mind what to do before the end came. At first I was in great favor because those patients I saw in consultation happened to live, but after an English general and a Red Cross worker died, whom I had undertaken the care of, my reputation suddenly diminished.

It is rather discouraging on coming home to find that after all these experiments nobody can find how the disease is propagated. That it passes rapidly from one to another is plain. The Red Cross worker who died was a volunteer nurse who only three nights before took care of a man who recovered. She went perfectly well to her night service; she came home in the morning tired, but before night she was sick and had that peculiar blue color which seemed to mark all early fatal cases.

I am only taking up your time to voice what seems to be the general tone of discouragement that no positive means of prevention is at present at hand to prevent the spread of the disease; for, of course, until we discover how the disease is spread, ways of prevention are of no avail.

## THE BACTERIOLOGY OF SECONDARY PNEUMONIA.

BY HENRY T. CHICKERING, M.D., NEW YORK.

It has been estimated that over five hundred thousand individuals in this country alone have died as the result of influenza infection during the past nine months, which predicates in almost every instance a secondary pneumonia. For the purpose of the present discussion, it is desired to consider as secondary pneumonia those varieties of pulmonary lesions, usually pronecho-pneumonic in type, that occur so frequently with influenza and measles, more rarely as a terminal result of chronic constitutional or metabolic disease, with infants suffering from malnutrition, and with adults following surgical operations, in contradistinction to acute lobar or primary pneumonia.

From a bacteriological study of lobar pneumonia extending over several years at the Hospital of the Rockefeller Institute,<sup>1</sup> pneumococcus was found to be the organism most commonly associated with the disease. (Table 1.)

TABLE 1.—MICROORGANISMS ASSOCIATED WITH LOBAR PNEUMONIA.

Pneumococcus .....	454
Friedlander bacillus .....	3
Streptococcus pyogenes .....	7
Streptococcus mucosus .....	1
Staphylococcus aureus .....	3
Mixed infections .....	6
B. influenzae .....	6

Furthermore, it was noted upon classification of the pneumococcus into biological types that the more virulent disease producing varieties, types 1, 2, and 3, were responsible for 79.8% of the infections, whereas the type 4 pneumococcus, the group found most commonly in the

nose and throat of normal individuals, was present in only 20.2% of 454 cases.

By the use of various differential culture media, it is possible to isolate in a considerable proportion of instances the pneumococcus from the nasal and throat secretions. Dochez and Avery<sup>2</sup> and Stillman,<sup>3</sup> who have made extensive studies of the bacterial flora of the upper respiratory passages of normal men, found the pneumococcus present in 43.2% of 398 individuals. But here in contrast to the results obtained from the examinations of pneumonic sputum, the type 4 pneumococcus was found predominant. Olmstead<sup>4</sup> in an examination of 2477 individuals about to be operated upon for some surgical condition, recovered the pneumococcus from the saliva or sputum in 32.2%, of which 73.8% were classified as pneumococcus type 4. A comparison of Olmstead's and Stillman's results is shown in Table II.

TABLE II.—THE OCCURRENCE OF TYPES OF PNEUMOCOCCUS IN SPUTUM OF NORMAL INDIVIDUALS AS COMPARED WITH THAT OF LOBAR PNEUMONIA.

PNEUMOCOCCUS TYPE	OLMSTEAD 798 cases	STILLMAN 172 cases	LOBAR PNEUMONIA 454 cases
1 .....	0.6%	2.2%	33.3%
2 .....	1.2%	2.2%	29.3%
2a .....	11.2%	13.6%	4.2%
3 .....	13.0%	23.4%	13.0%
4 .....	73.8%	58.5%	20.3%

When these studies were made by Olmstead and by Stillman the methods used were those which would enhance the growth of pneumococcus and retard that of other organisms present in the sputum. In order to learn more concerning the variety of other bacteria present, it is necessary to cultivate the secretions on media which will favor all alike.

When this is done, one finds many varieties of streptococcus, the viridans, the hemolytic and nonhemolytic strains, several kinds of staphylococci, *B. influenzae*, and members of the Gram-negative diplococcus group, as *M. catarrhalis*, *M. flavus*, *M. pharyngosicus*, diphtheroids, and the bacillus of Friedlander. Just what determines the presence or absence of any given group of bacteria in an individual's nose and throat is still obscure. In a few cases organisms that are known to produce the most severe forms of disease have been found over a period of years during which time the host has enjoyed good health. This is notably true in the case of carriers of pneumococcus mucosus and the Friedlander bacillus. Apparently there are

many favorable factors necessary before the bacterial parasite can effect a "take." Some of these factors seem obvious, though difficult to subject to scientific proof; those of sudden change of environment or occupation, those incident to the congregation of large masses of individuals together, and conditions favoring undernutrition. It is under these conditions that epidemics flourish and secondary pneumonias develop. Witness the terminal bronchopneumonia of the emaciated infant and the surgical pneumonias following general anaesthesia. Under unusual living conditions, diseases mild in themselves, as measles, or epidemic infections, as influenza, which may slumber for long periods of years, light up, spread rapidly, and render individuals susceptible to most virulent forms of pulmonary disease.

When pneumonia develops under these circumstances, a study of the micro-organisms present in the sputum and in the lungs reveals not the presence of the common disease producing types found in 75% of cases of lobar pneumonia but rather the type 4 pneumococcus, the group found so commonly in normal people and various other organisms as the streptococcus and the staphylococcus.

Olmstead, in an examination of the sputum of 126 cases of post-operative pneumonia, found the pneumococcus in 95 or 75.4% and of those positive, pneumococcus type 4 was found in 73 instances, or 61.9%. That these organisms found in the sputum had actually to do with the disease present was proved in many instances by demonstrating specific agglutinins in the patient's serum for the same type of organism found in the sputum, blood, or lung at autopsy. A comparison of these results (Table III) with those obtained from the examination (Table II) shows a close similarity. Here apparently all that was necessary in a certain proportion of individuals was the strain of an operation and the irritant effects of a general anaesthesia to allow organisms residing in the upper air passages an opportunity to produce pulmonary lesions.

An investigation by Wollstein,<sup>5</sup> in 1905, of the bacteria present in the pneumonic lungs of 67 infants who had previously suffered from various morbid conditions as athrepsia, enterocolitis, diphtheria, measles, etc., showed similar results, except that in addition to the pneumococcus, a considerable number showed strepto-

coccus, staphylococcus, and more rarely diphtheria bacilli and *B. coli*. At the time this work was done no attempt was made to isolate the influenza bacillus. Subsequently in 1906 the same author found *B. influenzae* in 16 of 53 cases of bronchopneumonia.<sup>6</sup> More recently, in 1916, Wollstein<sup>7</sup> studied the type of pneumococcus infection in 36 infants and found the group 4 pneumococcus predominant.

But few statistics are available concerning the bacteria associated with pneumonia developing in individuals having chronic heart, kidney, or metabolic disease. In the cases studied personally, of three diabetics, two had a type 3 pneumococcus infection and one a type 4 pneumococcus. One patient having chronic valvular cardiac disease died with a pneumococcus mucosus bronchopneumonia.

With the complicating pneumonia following the recent influenza epidemic, there is a striking similarity in the kinds of micro-organisms found by making cultures from the lungs post mortem to those reported by Wollstein in the bronchopneumonia of infants. Here again instead of finding single infectious agents present in a given case and that usually the pneumococcus, many other bacteria were found, notably the staphylococcus aureus as at Camp Jackson, S. C.<sup>8</sup> Frequently two or three kinds of bacteria were found in a single lung. (Table III.)

From this it seems justifiable to assume that the lung complications are the result of infection by autogenous micro-organisms, those carried commonly in the naso-pharynx. What determines the particular type of flora in the mouths of individuals in certain localities is not clearly known but differences seem to exist. But the immediate exciting agent of the secondary pneumonia in an individual whose resistance is depressed by a primary infection apparently resides upon the mucous membrane of the patient himself in the majority of instances. For how else can one explain the occurrence in the same ward or military organization of almost as many kinds of pneumonia, if classified on the basis of the infectious agent as there are kinds of micro-organisms found in the normal nose and throat?

With the secondary pneumonias following measles in the army camps, the outbreak was in most instances slower in evolution than was the influenza epidemic. Here the hemolytic streptococcus, found so frequently in the secondary pneumonias, had an opportunity to enhance its

TABLE III.—BACTERIA ASSOCIATED WITH SECONDARY PNEUMONIAS.

ORGANISM	OLMSTEAD Post-operative pneumonia 126 cases	WOLLSTEIN Infant Broncho-pneumonia 100 cases	INFLUENZA-PNEUMONIA Post-mortem lung punctures 512 cases
Pneumococcus, type 1	1	2	6
" type 2	1	12	16
" type 2a	8		
" type 3	12		29
" type 4	73	18	41
Pneumococcus, type undetermined		10	2
Pn. 1 and streptococcus hem.			1
Pn. 1 and B. influenzae			1
Pn. 2 and staphylococcus aureus			5
Pn. 2 and B. influenzae		1	3
Pn. 2 and B. inf. and staph. aur.			1
Pn. 2 and streptococcus		1	
Pn. 3 and staph. aur.			4
Pn. 3 and staph. aur. and B. inf.			1
Pn. 3 and B. influenzae			7
Pn. 4 and staph. aur.		1	16
Pn. 4 and staph. aur. and B. inf.			1
Pn. 4 and B. inf.		1	2
Pn. 4 and B. diphtheroid			1
Pn. 4 and M. flavus			1
Pn. and staph. aur.		11	
Pn. and B. tubercle		7	
Pn. and streptococcus		10	
Pn. and Klebs-Loeffler B.		1	
Pn. and B. pyocyaneus		2	
Pn. and B. coli		2	
Staphylococcus aureus		6	92
Staph. aur. and B. inf.			17
Staph. aur. and strep. non-hem.		3	3
Staph. aur. and strep. hem.			5
Staph. aur. and strep. vir.			2
Staph. and misc. organisms			4
B. influenzae	4		19
B. inf. and strep.			10
Streptococcus hem.	9		6
Streptococcus non-hem.		6	7
Strep. and misc. organisms	1	6	4
B. mucosus capsulatus	9		
Misc. organisms		3	5

virulence until after a few months not a few cases of apparently primary pneumonia were caused by this organism. While great interest and attention have been focused upon the hemolytic streptococcus in connection with measles, it is by no means the only organism associated with this infection. The influenza bacillus in pure culture has been found in such secondary pneumonias as well as pneumococcus and staphylococcus.

If the secondary pneumonias are dependent upon the kind of bacteria carried in the nose and throat, it explains to some extent the diversity of reports concerning the types of bacterial infection in various localities. The meager reports of the presence of staphylococcus aureus in the lungs of secondary pneumonias in some instances, at least, can be explained by its hav-

ing been regarded as a contamination and thus discarded from the report.

These studies have a direct bearing upon the clinical management of the individual patient. More attention must be directed to the care of the nasopharynx in acute infections. Thus far no ideal sterilizing agent for the bacteria of the upper air passages has been found. But much can be accomplished as regards cleanliness and suppression of congestion of the mucous membrane of this region. Secondly, it is reasonable to suppose that the violent paroxysms of non-productive coughing associated with measles and influenza aid in the dispersal of the bacteria of the nose and throat into the deeper air passages of the lungs. The harassing cough must be controlled. Occasionally elevation of the head of the bed a foot or more or various inhalations are helpful. But usually codiene is needed and should be given without hesitation in sufficient amounts to obtain the desired results.

#### SUMMARY.

In contrast to primary lobar pneumonia, which is almost always caused by the pneumococcus and moreover usually by the definite disease producing types of pneumococcus, the secondary pneumonias are associated with a great variety of micro-organisms, pneumococcus, streptococcus, staphylococcus, *B. influenzae*, *Micrococcus catharralis* and *flavus*, *B. Friedlander*, and others.

In primary lobar pneumonia, it is unusual to find more than one organism in the lungs in fatal cases. With the secondary pneumonias it is not uncommon to find two or more.

The types of bacteria and their percentage occurrence in secondary pneumonia compare closely with the bacteria commonly residing in the nasopharynx. Up to the present time there is no evidence that the strains isolated from the lungs are biologically different from those in the nose and throat.

What determines the bacterial flora of the normal individual's mouth depends upon a multiplicity of factors. Under ordinary conditions they probably cause little harm. But under the temporary lowering of the individual's resistance, they are able to produce widespread lesions and in the presence of an epidemic may enhance in virulence to the extent of being able to cause what is apparently a primary pneumonia.

Careful hygiene of the upper respiratory passages and measures aiming to prevent the dispersal to the lungs of bacteria residing there are advised.

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#### CLINICAL THOUGHTS ON INFLUENZA.

By EVERETT A. BATES, M.D., SPRINGFIELD, MASS.

SPENCER's oft quoted lines,—“What evil star on you hath frowned and poured his Influence bad”—is appropriately suggested in view of the indecisive and still debatable evidence as to the exact cause of the recent alarming and world-wide scourge.

All contributions to its etiology must be balanced and controlled, and conclusions held in abeyance until uncertainties are eliminated or harmonized, and the primary infective agent known. Apart, however, from our great interest in the final summation of observations from varied sources and from the organized medical departments of many armies,—the clinical picture of influenza and its attendant virile complications must remain to all who were associated with its victims as a vivid, hideous memory; but leaving the imagination an almost unwilling believer that such an evil time has existed.

While this picture of influenza varies with the prominence of local symptoms and the thought is more readily occupied with the severity of the respiratory tract invasions, as an almost distinct and definite entity,—the simpler type of this epidemic is of interest clinically in comparison with other similar outbreaks; and it is pardonable to quote Sir George Baker's account of the epidemic of influenza in London in 1762:—“It was characterized by alternate heat and chills, by a constant cough, sometimes dry, occasionally accompanied by a little thin mucous expectoration. There was depression of strength, a sense of weight, and severe pain in the forehead and temples; inflamed, swollen, and watery eyes, with photo-

phobia, frequent sneezing, and altered voice. There was painful rawness felt in the wind-pipe and chest, with, in some cases, a feeling of choking, and wandering pains in the arms, legs, and sides. The fever was chiefly nocturnal, but even then so slight that it rarely interfered either with sleep or food. There was more or less perspiration, and where it was profuse the disorder was relieved or cured. In all cases there was more depression of spirits and loss of strength than the character of the disease seemed to account for; and convalescence was often tedious and imperfect." In this portrayal of an epidemic occurring more than a century and a half ago we find an outlining of a symptomatology that fits surprisingly well with that of the recent one when uncomplicated. But while a striking similarity may exist, our memory recalls the severe muscular, head and back pains of the influenza outbreak of '89 and '90, not notably present during this as evidence of an interesting variation in different epidemics of a disease noted for its varied aspects. As the recent epidemic rolled up the number of its early victims, and apart from the too frequent pulmonary complication, and other clinical phenomena which rightly or wrongly were attributed to influenza, we recognize a rather constant and characteristic clinical picture with definite tell-tale symptoms.

The suffused eyes, sneezing and purposeless cough—almost, especially in children, suggesting the early stage of measles—the fairly constant, slight, early cyanosis of the lips, the slow, often dirotic pulse, the sudden lowering of resistance disproportionate to the severity of the disease, the subjective substernal feeling of soreness and rawness, were the most common early symptoms.

And as our experience rapidly became larger we learned to estimate the possibilities that the fourth, fifth, and sixth days might have in store for the patient, and to note this or that variation in the fever, and typical symptoms with well justified apprehension for sputum examinations by a good technician in 70 of the first cases showed alone or in combination some type of pneumococcus in 62—all but eight, and 47 times alone—some strain of streptococcus alone or in combination in 7, and the *Bacillus influenzae* in less than one-third, or 19 cases, thus early establishing a feeling of uncertainty as to the etiologic significance of the latter or-

ganism, but leaving no doubt as to the number of associated bacteria capable of a high degree of pathogenic harm.

Whatever may be the eventual fate of Pfeiffer's bacillus, or, a possible conclusion, an influenza virus, the presence of which caused a feeble and lowered immunity in the host to other bacteria,—clinically, we were often confronted with what seemed to be a primary lung infection not secondary in any way to an earlier influenza. It was a new picture. The subject commonly selected was a healthy young adult from 20 to 35, so that I reasoned for a while that the epidemic of '90 might have given a very general immunity to those over the latter age.

The onset of lung involvement was never like the typical pneumonias: but often a slow, gradual rise of temperature, and a steadily increasing toxemia, with an inability to demonstrate by physical examination of the chest the presence of a definite lung pathology.

Where pneumonia did not occur, as in those cases running a short favorable course, there was a preponderance of tracheal congestion, with distressing, hard cough, sore wind-pipe, and pain in the epigastrium and adjacent lateral areas, either from muscular spasm, or possibly a lymphatic extension from the region of primary infection. The absence of friction sounds has been universally observed even in influenzal pneumonia: and the assumption of a diaphragmatic pleurisy in the milder cases is not warranted.

And there were those, where lung invasion was unsuspected because it could not be demonstrated, that were probably slight bronchopneumonias: so that some observers have believed that the whole epidemic was purely pneumonic, varying in degree of intensity according to the extent of the process; fatality at least was never due to pure influenza. My own observations lead me to the conclusion that the trachea may be considered the most constant primary point attacked, with recovery in a few days where the disease remained thus localized; but readily extending through the blood stream, or latent and exploding as it were in numerous small, disseminated and deeper seated foci, by the coalescence of which large areas of lung tissue became involved.

It was a fair working rule that if any patient had continued fever for more than five days, pneumonia was present, no matter if the

physical examination gave little evidence; and as a complication of influenza it was most often noticed in those who were unwise enough to leave their beds before 48 hours after the sub-normal temperature.

In the Springfield Hospital, out of 80 nurses, 33 contracted influenza; there were no deaths and only six cases of pneumonia complicating; this fortunate result I feel sure was due to the wise and strict orders of the superintendent of the Hospital,—that every nurse should report upon the earliest feeling of illness.

In the course of influenza there seemed often a period of calm before the explosion of pneumonia; the temperature was slight, the pulse slow, and the respiration gave no hint, except perhaps a persisting moderate cyanosis of the lips and finger nails—but enough to alarm the observer at once; for among all the symptoms of this epidemic disease no one augured a greater possible ill to the patient than this striking omen; it varied in degree and extent according to the severity of the attack, and must have been due to the degree of toxicity of the infecting agent; for it occurred early and before embarrassment of the respiratory area or of the right heart had developed. In the earliest cases I was led to inquire if any coal tar

products or combinations had been taken, owing to the similarity of color produced. If to the symptom cyanosis there was added a sharp rise of temperature and bright bloody expectoration, we knew the fight was on. Bloody sputum—varying in shades of red, and in consistency from thin and watery fluid in large amounts to more tenacious smaller quantities—was a definite hall-mark of influenzal pneumonia, and distinctly separated it from other types; rusty sputum was seldom seen and we saw nothing of the greenish, coin-like lumps which Pfeiffer taught were so characteristic of influenza.

The blood in the sputum, sometimes amounting to haemoptysis, the very common and often profuse nose bleed, the not infrequently exaggerated menstrual flow or actual metrorrhagia, gave a distinctive hemorrhagic form to this epidemic; and as a dominant symptom it is not often mentioned by writers upon previous outbreaks of the disease.

While the incidence of other symptoms in the course of the disease is noteworthy,—as apathy, drowsiness, and mild delirium, which sometimes became so active as to require constant watching, and in two cases the use of the jacket; as an epileptic status of an hour's duration in

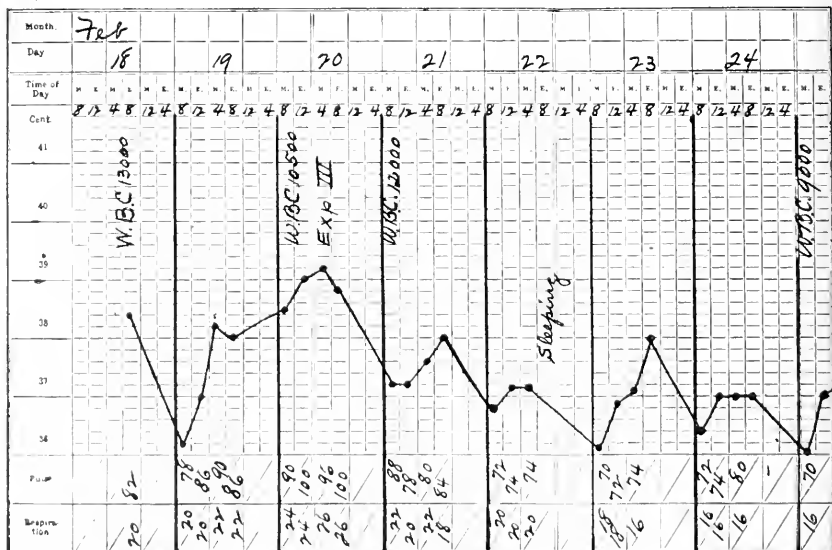


CHART I.—Temperature chart of F. W. B., inoculated Feb. 13, 5.30 P.M., with the secretion of an early case of influenza (22 hours after onset).



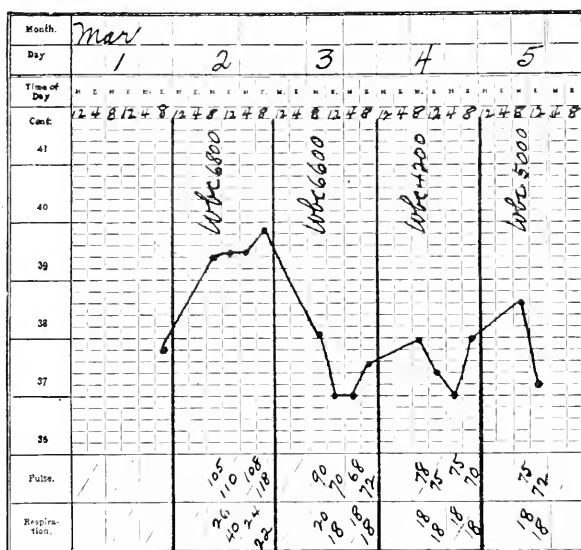


CHART II.—Temperature chart of S., inoculated 7 P.M., Feb. 24, with secretions from a case of tonsillitis who had, in turn, been inoculated two days previously with secretions from very early cases of epidemic influenza.

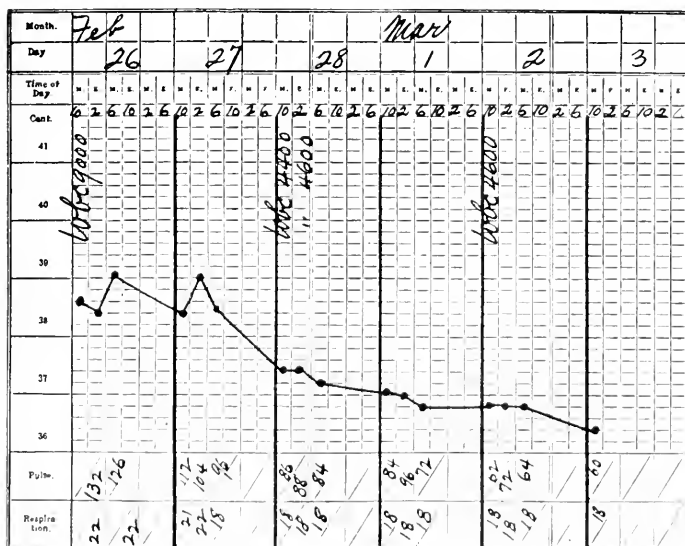


CHART III.—Temperature chart of L. J., inoculated 7.30 P.M., Feb. 24, with secretions from a case of influenza four hours after onset.

the midst of pneumonia: as nausea and vomiting of predominant intensity: as adult acidosis; as jaundice—a common symptom in a group of young lady college students; as diarrhea in a few—the first influenza seen September 16, a young man from Commonwealth Pier, being of this type; all these thus illustrating the protean manifestations of the disease,—the consideration of its so-called complication bronchopneumonia as the one characteristic clinical picture of influenza constitutes primarily the discussion of the disease.

As has been stated, it was often difficult from physical examination to find that the pneumonia one had reason to suspect existed; and often chest examinations resulted in a confusing conclusion, owing to the absence of the commonly accepted signs of pneumonia, or a difficult explanation of the findings which were by no means constant in type, and sometimes of changing character, even with a change in lateral posture; for all degrees of involvement existed, and all sorts of combinations, from capillary bronchitis to diffused lobular or confluent conditions. In the larger number of cases the pulmonary process began in the posterior left lower lobe, generally inside the inferior angle of the scapula, and was evidenced first by slight dullness and impaired breath sounds, at times accompanied with an explosion of fine râles on deep inspiration.

Commonly at this time nothing could be detected in the opposite side; but later this was with rare exceptions sure to be affected, not always to the same extent; this second involvement was in a few cases delayed until the original process had abated, and a sense of security was rudely dispelled by renewed temperatures and a return of desperate conditions. Very soon after the appearance of the earliest signs, small but fairly distinct patches of bronchovesicular breathing and rather distant increased voice sounds could be heard; these areas seemed to extend by coalescence, and finally, often rapidly, occupied large portions of the lungs, generally in the middle and lower back, appearing eventually as massive consolidations with tubular breathing and voice sounds in typical pneumonic purity. Little evidence of an attendant bronchitis existed in these completely solidifying portions at any stage; but at their margins and often through the lateral chest zones and into the anterior, the bubbling, non-

consonating râles of the medium sized and finer bronchial tubes were apparent. The apices were often involved secondarily, the process giving more frequently the signs of bronchitis or bronchiolitis than of pneumonia.

In the very fat and almost always fatal cases there was less completed coalescence of pneumonic areas and a more extensive and generalized lobular process with signs lacking in definition; these showed an earlier urgent dyspnoea, abundant pink or red sputum and a "heliotrope" tinted cyanosis, changing to an ashen pallor before death. Occasionally the patient seemed to be drowning in the excess of his pulmonary secretions.

One physician with more emphasis than elegance exclaimed, "These are not pneumonias, but lung rot."

Of peculiar and startling interest were those cases of what were probably extensive compensatory emphysema with rupture into the loose mediastinal tissue and attendant upon widespread bronchopneumonia; in a child the greatly increasing lung volume caused in places a laceration of the costal pleura; in an adult the appearance of subcutaneous emphysema was first noted as a painful lump in the cheek, suggesting the look of a good-sized chewing quid; later, crepitation extended to the groins; in another, there was marked exophthalmus, with swollen features, enormous neck, and prominent breasts; one emphysematous case recovered; in this the praecordial area of dullness was replaced by one of tympany which was also present over the left apex; these signs could not have been due to pyopneumothorax; convalescence was very stormy and included an abscess of the left lung with rupture into the pleural cavity, and empyema.

It was never possible in typical influenza pneumonia to demonstrate beyond doubt fluid in the pleural cavity; a sense of percussion resistance at times suggested effusion, and even the ray findings were occasionally positive, when the needle test was a dry tap; if fluid were present it must have been as a thin layer and crowded upward by excessive lung volume.

During the epidemic, empyemas were rare, and when present warranted the conclusion that the case had been one of ordinary pneumonia. It was possible for a primary influenzal pneumonia to be followed after a period of normal

temperature by lobar pneumonia with intense diaphragmatic pleurisy.

One needed during the convalescence of these influenzal pneumonias to consider carefully the probable chest condition in order to establish with a reasonable degree of accuracy the actual pathology; the persistence of dullness and modified breath sounds was notable; and generally, even after the decline of temperature warranted the assumption of an established convalescence, there was not the ratio drop in pulse rate and respiration usually seen in pneumonia.

Very commonly in these pneumonias the thermometer reading was  $102^{\circ}$ , but temperatures in some cases ran high; one was recorded and carefully verified at  $108^{\circ}$  (rectal) in which recovery occurred. Subsidence of temperature was more often by lysis. Even with high temperatures there was often a slow pulse rate, this rising in the later stages; but whatever the rate there was always in the beginning a distinct impression that the cardio-vascular system was profoundly depressed, and early led to the consideration and advisability of cardiac stimulation; blood pressure readings in a good proportion of all cases were low, especially the diastolic, and in keeping with a toxic myocardium; the leucocyte count was low where resistance was low, and was peculiarly constant during the initial infection and early pneumonia stage, persisting throughout in the fatal cases.

The consideration of influenza from its clinical side has been elaborated and made possible by the opportunities that our great cantonnements gave for specialized and statistical study; clinical thoughts without the aid of notes can at best record only impressions.

All clinical observation has for its ultimate purpose the therapeutic improvement of the existing disease and the lessening of the patient's danger.

Influenzal pneumonia gave the medical profession throughout the world a clinic in respiratory disease of unsurpassed interest and an opportunity to test its resources against the most virulent infection of modern times.

In spite of an acknowledged impotence in the fortunately rare fulminant case, where an overwhelming toxemia and a respiratory exodus quickly closed the scene, the recrudescence of the epidemic after Victory Day found physicians more alert and with thoughts better crystallized.

Every influenza became a pneumonia suspect; there was daily search for the impaired percussion note at the bases, or the fine crackles on deep inspiration and cough, or the broncho-vesicular breathing and whispered voice; at times there was typing of sputa and the consideration of sera, difficult to secure when at a distance from large clinical centers; there was the recognized importance of rest and a complete relief from cough at night by means of dependable sedatives; there was an earlier thought of cardiac support anticipating a possible exhaustion of the heart muscle; there was a more systematized vigilance, and a knowledge and definition of rational procedure in treatment that gave a sense of satisfaction even in the presence of defeat.

The spirit of untiring devotion among medical workers was never more stimulated than during the recent ordeal. In spite of the tears and tragedies left by the ebbing tide of this great wave of pestilence, its review in retrospect will give courage for the future.

#### DISCUSSION.

DR. P. CHALLIS BARTLETT, NEWTON: I will take but a moment to summarize the results of the clinical follow-up on influenza cases, studied by the Community Health Station at Framingham. It seemed necessary for us to find out as much as possible about the after-effects of the influenza epidemic.

In this clinical examination work we have been able to examine 700 cases following influenza. We tried to select for this examination work only the cases that had had well defined influenza.

1. Most of the examinations were made at their own homes.

2. The majority of the examinations were made from two to six months after the people had recovered from the influenza.

3. Forty-one per cent. of the people examined were in the industrial age group.

4. Broncho-pulmonary signs were found in 11%; in examinations on other groups previous to epidemic, 6%.

5. Cardiac signs were found in 8%; in previous examinations, 5%.

6. Active tuberculosis cases were found in 2%; in previous examinations, 1%.

This is somewhat modified by the fact that there were more people with pulmonary symptoms who requested examinations than in previous drives.

Many physicians have felt that tuberculosis would be increased to some extent by reason of the influenza epidemic. In our work thus far we have seen but little actual increase as the result of the influenza.

## TREATMENT OF INFLUENZA-PNEUMONIA BY USE OF CONVALESCENT HUMAN SERUM.

BY WILLIAM R. REDDEN, M.D., LIEUT., M. C., U. S. NAVY.

Chief of Medical Service, Chelsea Naval Hospital.

On September 28th, 1918, serum from convalescent influenzal pneumonia patients was used at my suggestion, in the treatment of this type of broncho-pneumonias at the Chelsea Naval Hospital on the service of Lt. Comm. McGuire. The outcome in the treatment of 151 such cases has already been reported in the *Journal of the American Medical Association*,<sup>1</sup> where details of the procedure are given in full.

It is now my purpose to present the results of similar treatment in 100 cases in private practice.

At the time of the first report it was considered impracticable to do this type of work outside of a hospital. However, during the early part of December the demand for such treatment became so urgent that I, with my assistant, Mr. Arno, undertook the work of obtaining serum from civilians and of treating all cases which came to my attention, whenever I had serum. May I say in passing that I have never had a patient, either in the Naval Hospital or outside, who did not willingly give me all the blood I requested. In fact, they all considered it an honor to be able to help.

This report necessarily differs from those preceding, chiefly because all but five or six of these cases were seen from two to five days later in the disease than those at the Naval Hospital, where the majority of the cases developed the pneumonic complication on the wards and were given serum within the first twenty-four hours of the appearance of definite lung signs. The reason for the delay was due mainly to the fact that many of the physicians did not wish to have serum given when a patient appeared to be taking care of the disease without its help.

The diagnosis was usually established by the clinical influenzal onset of high temperature, headache, and a varying amount of pains and aches, and a low white blood count, followed in a few days by chest signs, either with or without intervening normal temperature. I have omitted several cases where lung signs were doubtful, so that this group includes only those showing definite signs of lung involvement. All but four cases were seen by at least two, and about one-fourth by three physicians.

The data are summarized in the following tables.

TABLE I.—PERSISTENCE OF FEVER AFTER FIRST INJECTION OF SERUM.

Normal in 24 hours or less .....	42
Normal in 58 hours or less .....	33
Normal in 72 hours or less .....	8
Normal in four days + .....	1
	84

Table I shows that the temperature in almost one-half of the cases dropped to normal within twenty-four hours of the first injection of serum, and that in three-quarters the temperature was normal within forty-eight hours. This, to me, indicates a decided shortening of the course of the disease.

TABLE II.—NUMBER OF INJECTIONS EACH PATIENT RECEIVED.

NUMBER OF INJECTIONS	NUMBER OF PATIENTS
1 .....	52
2 .....	35
3 .....	8
4 .....	3
5 .....	2
	100

The average amount of serum given at each injection was 120 c.c.

Table II shows that over half the cases treated required only one dose of serum, and that over three-quarters required only two doses or less, which would seem to indicate that the 120 c.c. dosage was sufficient. It should be remembered that 120 c.c. represents only 100 c.c. of serum and that the remainder is salt solution in which the 0.30 per cent. trikresol is made up.

Of this group 76 had a white blood count either normal or below. The lowest was between 2500 and 3000. This was without regard to the time in the disease when first seen.

A group of 13 women advanced at least five months in pregnancy is also included. Of this number 3 died, or 23 per cent. Reports from clinicians who have dealt with large groups of pregnant cases show considerably higher percentages. For example, Woolston and Conley<sup>2</sup> had 52 deaths out of 101 pregnant cases, or a mortality of 51.4 per cent. And Harris<sup>3</sup> reported a mortality of 54 per cent. in a group of 678 pregnant women. It would appear, therefore, that even in pregnancy cases the serum helped to lower the mortality.

The total number of deaths out of 100 cases reaches a maxim of 16, or 16 per cent., which is four times that obtained in the Naval Hos-

pital group. But a mere statement of mortality conveys an impression just as erroneous as if one gives statistics on diphtheria antitoxin when used on the third or fourth day of the disease, or on the use of anti-pneumococcus serum Type I in late or moribund cases. In other words, although the use of the serum has frequently seemed to do wonders, yet those accustomed to serum therapy recognize the importance of early administration, and know only too well that certain processes reach a stage irreversible by any procedure, or treatment. In order, therefore, to gain a correct conception of the mortality in this group, it is necessary to give a summary of the type of cases which died. Hence the following table.

TABLE III.—SUMMARY OF FATAL CASES.

CASE NUMBER	AGE	CONDITION WHEN SERUM WAS FIRST GIVEN	DAY OF DEATH	TIME OF DEATH AFTER FIRST TREATMENT
11	23	Moribund	6	4 hours.
25	27	Severely sick	7	2 wks. 200 c.c. pus removed from pericardium. Died 14 hours later
31	45	Moribund	6	6 hours
38	32	Cyanotic	7	14 hours
46	30	Pregnant, moribund	5	2 hours
50	50	(Poor condition, weighed about 280 pounds)	3	Normal in 18 hrs., remained so for 3 days, sat up suddenly, dropped back dead. Card. failure
55	28	Moribund	8	2 hours
56	30	Moribund	5	5 hours
58	30	Pregnant, cyanotic, irrational	4	3 dys. Ran normal temp. all 3 days, but grew constantly worse
60	45	Moribund	7	30 minutes
64	60	Cyanotic, irrational	6	18 hours
76	33	Pregnant, cyanotic	4	Temp. normal in 12 hrs. but grew rapidly worse
78	30	Severely ill	2	28 hrs. Given 3 doses of serum with no effect
87	28	Moribund	5-6	12-16 hours
89	27	Cyanotic, moribund	5	18 hours
93	28	Moribund.	5-6	12 hours

It is evident from the above that the condition of certain patients did not warrant the use of serum, except as a last resort and then chiefly as a consolation to the rest of the family. For example, cases 11, 31, 38, 46, 55, 56, 60, 64, 76, 87, 93, where the first administration of serum was on the fourth day of the pneumonic involvement, or later, or where the patient was practi-

cally moribund, as indicated by the fact that death occurred in such a short time after the first visit, a time varying from  $\frac{1}{2}$  hour to 35 hours. Case 25 died of hemolytic streptococcus empyema of the pericardium, two weeks after the first administration of serum. Furthermore, case 50 had a normal temperature, pulse, and respiration for 3 days after the first dose of serum, then in an effort to sit up, dropped back onto the bed dead. She was a woman weighing 280 pounds, and in all probability died of acute dilation of the heart.

Therefore, by excluding the cases where the serum was given too late in the disease, and also those who died of complications other than pneumonia, there remain only 3 deaths, or a minimum mortality of 3 per cent. In all probability a just estimate of the efficacy of the serum lies between 3 and 16 per cent.

I now wish to review briefly the work of other observers along the same general line. This includes the use of whole blood, and plasma, as well as just serum separated from the clot. Ross and Hund<sup>4</sup> at Mare Island, California, treated 28 cases by transfusion and ran a control group of 21 similar cases untreated by this method. In the untreated group the mortality was 42.8 per cent., whereas the treated group showed only 21.4 per cent.

Brown and Sweet<sup>5</sup> treated 2 cases of marked broncho-pneumonia by transfusion with excellent results.

MacLachlan and Fetter<sup>6</sup> have reported 54 cases treated by use of citrated blood from convalescent cases. Of this group 34 recovered and 20 died, a mortality of 27 per cent. They suggest the exclusion of 7 cases moribund at the time of first treatment. This would leave 13 deaths, or a mortality of 24 per cent.

The criticism I wish to make in regard to this work is that patients received the blood of only one convalescent at each dose, and since I have shown that about 15 per cent. of such convalescent sera are inactive, there is a fair chance that a number of the treated cases were given blood of no potency. Furthermore, MacLachlan and Fetter used a dosage of only 100 c.c. of whole citrated blood, which would mean about 60 c.c. of serum, a dosage entirely too small, especially in severe cases. Moreover, I have found in the cases at the Naval Hospital as well as in the severer cases in private practice, that better results are obtained by giving at least 2 doses

within a 24-hour period. For example, in one desperately severe case with a bad mitral disease, I gave 750 c.c. of serum in five doses, within 48 hours, with a favorable result.

In addition, this method necessitates careful blood grouping, hence a delay in administration and difficulty in pooling blood from four or five cases. Fortunately, when the work at Chelsea was started we had from thirty to forty donors so that, even when we did not use pooled serum, we readily found plenty of donors whose serum had demonstrated potency. Hence practically none of the earlier cases went without receiving an effective serum within 24 hours of the first injection when that proved worthless.

This brings me to the consideration of the work done by Hartman and O'Malley<sup>7</sup> at the U. S. Naval Hospital, Washington, D. C. As soon as our work at Chelsea came to the attention of Admiral Stitt, he wired for all details of technic. These were furnished by me through my commanding officer. Then the work with plasma from convalescent patients was instituted. The choice of plasma was due chiefly to the fact that Dr. Hartman had devised a simple method for transfusion, which was easily adaptable to the preparation of citrated plasma. These observers pooled the plasma, therefore their work is more comparable to that done at Chelsea, than that in which whole blood from single donors was used. Hartman and O'Malley report 111 untreated cases, with 28 deaths, or a mortality of 25.2 per cent., whereas a group of 46 cases, treated with the pooled plasma, showed only 3 deaths, or a mortality of 6.5 per cent. They further report that treatment in all 3 fatal cases was begun late. Their conclusions are: that the toxemia of influenza seems to be neutralized by the plasma of convalescent patients, that a large percentage of this plasma is active, but that most satisfactory results are obtained by pooling.

This brings me to the use of unpooled serum. Kahn<sup>8</sup> reports that only clinically grave cases with toxemia, extreme dyspnea and cyanosis, and extensive lung involvement were chosen, both for serum treatment, and for control. In all, 25 cases received serum; 12 died, giving a mortality of 48 per cent. The control group of 18 similar cases showed 12 deaths, or a mortality of 66.6 per cent.

It is evident from this work that the serum was given the most severe kind of test, yet the

difference in percentage of mortality between the treated and untreated cases suggests something more than a mere coincidence. Kahn concludes that from the relative percentage of mortality in the two series, as well as from the surprising beneficial effects of the serum in individual cases, that he believes the serum from convalescent influenza-broncho-pneumonia patients deserves further trial in the treatment of this disease. He does not state whether he used pooled serum. If he did not, the criticism I made concerning the use of serum or blood from single donors holds.

Bass and Ervin<sup>9</sup> at the U. S. Marine Barracks, Paris Island, N. C., selected 55 of the most severely ill patients in their wards. They treated 7 with whole citrated blood and the remaining with unpooled serum. Five out of the 7 receiving the whole blood, and 13 out of the remaining 48 receiving unpooled serum, died; a case mortality of 27 per cent. These writers agree with us that serum from patients without lung involvement is of little value: that donors vary widely in the potency of their sera. They also agree with us in the infrequency of chills, after the use of serum, for only 5 are reported out of the group treated. They conclude that in spite of the high mortality rate, they are satisfied beyond a shadow of a doubt that the use of serum from convalescent influenza-pneumonia patients is of marked value in the treatment of influenza-pneumonia. They emphasize the importance of early diagnosis and treatment.

Finally, I come to the work of Gould<sup>10</sup> at the U. S. Naval Hospital, New York. Gould reports 320 untreated cases of this type of pneumonia, with a death rate of 26.16 per cent., whereas 30 cases treated with unpooled serum showed 2 deaths, or a mortality of 6.6 per cent. I do not mean to infer that this contrast should be accepted as it stands, for Dr. Gould told me that the untreated cases occurred chiefly at the beginning of the epidemic, whereas the cases treated with serum came later. However, I believe it is fair to say that the difference in mortality between the two groups is too great to be accounted for by this time element, especially when I know that many of the treated cases had extensive lung involvement and were decidedly toxic.

*Conclusions.* After the treatment of over 250 cases of influenza pneumonia by the use of

pooled serum from convalescent patients, there remains no doubt in my mind that when a proper diagnosis is made, and the treatment is correctly carried out, both in hospital and private practice, the course of the disease is decidedly shortened, the death rate is at least cut in two, in cases chosen for their severity, and reduced about three-fourths in any large series in hospital practice where the cases are seen early. These conclusions are substantiated by the reports of at least 12 unprejudiced observers.

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## DISCUSSION.

DR. FREDERICK T. LORD, Boston:—I have been much interested in Dr. Redden's work. The necessity confronts us of trying to form a judgment whether the method is of value or not. Unfortunately, I do not believe that the question as to its value can at the present time be answered. There are, however, certain considerations which have a bearing on this matter.

There is little to guide us from analogy with other diseases. Ordinary lobar pneumonia is the nearest analogy we have and it may be said that ordinary lobar pneumonia has nothing to do with the kind of pneumonia under discussion. Experimental studies in animals indicate that protective substances are usually but not constantly present in the blood of patients recovering from the disease. Their inconstancy and presence in positive cases only in small amounts do not suggest that a similar method of treatment applied to ordinary lobar pneumonia would be of much assistance.

In attempting to judge the merits of such a method of treatment it is easy to be misled without a control group of cases. The varying mortality from influenza pneumonia without the serum treatment, in this neighborhood, illustrates how cautions we should be. For example, data obtained from Major Paul G. Woolley, Camp Devens, indicate that during the period from October 2nd to October 29th, there were 231 cases of pneumonia at Camp Devens and

that of this number 127 (54.9%) died. Of 2,817 cases at Camp Devens from September 4th to October 29th, 787 (27.9%) died. Comparison of Dr. Redden's series with such a group as this would suggest curative value in the serum. But returns from certain other sources indicate that during the epidemic period the mortality from broncho-pneumonia in non-serum treated groups of cases was low. Thus figures obtained from Dr. Marshall H. Bailey of Cambridge in a small number of cases among the Students' Army Training Corps at Harvard show that of 46 cases with the physical signs of broncho-pneumonia and about 15 more with questionable broncho-pneumonia, there were only five deaths, a mortality of 8.1%. No reliable statistics are available for the civilian community; but reports from certain individual physicians practicing in this neighborhood suggest that the mortality from broncho-pneumonia may be even lower than this. Thus one physician reports only one death from broncho-pneumonia and that in a patient with mitral stenosis, among about 25 cases. Another had no deaths in about 15 cases. A third had only one death, and that in a pregnant woman, in about ten cases, and a fourth no deaths in eleven cases. In this civilian group of about 61 cases only two died, a mortality of 3.2%.

We have had too small a group of serum-treated cases at the Massachusetts General Hospital to draw any definite conclusion. We treated 23 cases with the convalescent serum and lost six out of this group. At the same time we had 25 controls and of these we lost only three. There may have been extenuating circumstances among the treated cases, but that is what we have to show and I think that only mortality counts.

DR. EDWIN A. LOCKE, Boston: I have been extremely interested in this work which Dr. Redden and Dr. Maguire have been doing with convalescent serum in cases of influenza with pneumonia, and in private cases have been much impressed with the apparent excellent results of its use. In a small series of fifteen private cases treated during the past fall and winter my experience seemed so favorable that I felt there could be no question of the value of this method of treatment in influenza pneumonia. I must confess also to the same feeling which Dr. Lord has expressed, namely, that if I had the disease I should wish the serum administered. It is difficult, however, to explain the apparent good results on scientific grounds, and personal impressions are not sufficient to prove its value.

Early in February a special service for influenza cases was established at the Boston City Hospital and thus afforded an unusual opportunity to test the effects of the serum from convalescent cases on a series of patients suffering from pneumonia with influenza. In order to

make the test as accurate as possible for each case given this treatment we used a simultaneous control. In other words, in every instance we selected two comparable cases so far as age, duration, type of disease, etc., was concerned, administering serum to one and not the other. Dr. Redden's method of preparation and administration of the serum was followed exactly. Blood was taken only from those convalescing from a severe and typical attack of influenza pneumonia and only pooled serum was employed. Although the clinic was a large one the patients were seldom admitted previous to the fourth or fifth day of their pneumonia and in consequence it was possible to select but a relatively small series of cases in sufficiently early stages of the disease to be considered favorable for treatment. In all, 22 cases have been treated and controlled by a similar number of untreated cases.

Our results have been entirely negative. In each group there were ten deaths, or a mortality of approximately forty-five per cent. Apart from these figures we have seen no results in individual cases which were in any way convincing. A careful study of the charts of these cases and their controls fails to show any advantage whatsoever in favor of the treated cases. No unfavorable symptoms have ever appeared following the injection of the serum, and so far as we are able to judge, the procedure is entirely free from danger of any sort.

It is unfortunate that the group of cases studied is such a small one, but even so small a number as twenty-two, with controls, is of more value in testing the merits of this method of treatment than many hundreds of cases without controls. It would seem inevitable also that were the use of the serum of as much importance as Dr. Redden's figures indicate, that even in so small a series, favorable results would have been very evident.

In conclusion, I do not feel justified from so limited an experience in condemning the treatment with convalescent serum as without merit. I can only say that we have thus far been unable to demonstrate any.

DR. WILLIAM R. REDDEN, Boston: Of course, I do not know much about Dr. Lord's cases. I know about my own cases. The fact remains that I have treated 250 cases with serum. It does not seem that the lowered mortality was simply accidental, or due merely to a difference in the period of the epidemic.

When you go into a room and find a pregnant woman toxic and ready to slip out, and give that woman serum, and twelve hours later find her convalescent, you cannot help thinking that something more than luck attended the treatment. You feel sure that mere mortality statistics do not tell the whole story.

Now one physician stated that mortality statistics were the only things which impressed him.

But to my mind, unless one analyzes the time element they are no good. For any group of cases, both treated and untreated, which came late in the disease, would show about equal mortality. The work of Amos and Chesney on poliomyelitis serum has been discredited chiefly because others attempted to treat only late cases. It so happened that Amos and Chesney built their hospital, got their serum early in the treatment, and gave their serum intraspinally and intravenously, and they kept everlastingly at the work. It was the enthusiasm of these two men, as well as the results they obtained, which inspired me to undertake this work while I was at the Rockefeller Institute.

Furthermore, the treatment of pneumonia by Type 1 serum has fallen into disrepute in this state because it has been carried out improperly. In other words, the State Board will not give out Type 1 serum simply because individuals will not make a proper diagnosis. I have reported 490 cases that have been treated by ten physicians. In no case has there been any doubt about the good reaction of the serum. I have no intention of criticising either of the speakers, but I still think that my position of having treated 250 cases is different from that of the individual who has treated only 30, whether they are controlled or uncontrolled. The controlled cases on the outside have been favorable for those who used serum.

I am not here to make claims, but when one feels that results have been obtained, one rather adheres to the one method which has done some good. I am willing to stand by the judgment of those who have used the treatment.

Both speakers admit that they would have serum treatment if they were so unfortunate as to come down with the disease.

#### THE SURGICAL TREATMENT OF ACUTE EMPYEMA FOLLOWING INFLUENZA.

BY WYMAN WHITTEMORE, M.D., F.A.C.S., BOSTON.

BECAUSE the acute empyemas following influenza of which I shall speak today are all my own cases, I shall feel at liberty to discuss them and criticize the way in which they were handled quite freely (and it may be that we shall draw some helpful conclusions from the results).

In a series of 39 cases, 33 at the Massachusetts General Hospital including the private ward and 6 outside, I have operated on and taken care of 38 cases, and if a good deal of emphasis is put on the after care it is because of its very great importance. The one case not operated on is included as this patient got well without operation. This case will be spoken of later.

Of the 38 cases operated on I regret to say



that two died. Both of these, I believe, should have lived, and I shall tell you of my mistakes later.

It has been an exceedingly interesting series for many reasons. In the first place they were the sickest large series of empyemas I have ever seen. Many of them had a broncho-pneumonia at the time of operation—and some had a double broncho-pneumonia. In a few cases this persisted for a long time after operation, frequently lasting as long as two or three weeks. Many cases were delirious and a few were unconscious at the time of operation. I saw one young man out of town and sent him to the Massachusetts General Hospital. To this day he does not remember my seeing him at his home or going to the hospital or even being operated on. The physical signs were quite misleading in some cases. Whether one was dealing with a small amount of fluid in the pleural cavity or with a patch of pneumonia was not always clear. Therefore, before operating, aspiration was done when possible. This is an exceedingly necessary step to take. The study of the aspirated fluid is of great importance. It is well to know the organism, the nature of the fluid and the cell count before choosing which operation to do. The patient should be x-rayed when his condition warrants it. The x-ray is not perfection and may make mistakes, but in the great majority of cases what it shows is correct and is of great assistance. For instance, in one case all the physical signs were below the angle of the scapula, but the x-ray showed an encapsulated empyema much higher; and as I believe an encapsulated empyema should be operated on very differently from a general empyema, this gave me my clue not only as to what operation to do, but also as to where to find the pus.

Cultures of the fluid aspirated from 30 of these cases showed the following:

- 19 Pneumococcus cases.
- 6 Streptococcus cases.
- 3 Staphylococcus cases.
- 1 Streptococcus and Pneumococcus case.
- 1 No growth.

In a few of the pneumococcus cases that were typed the majority belonged to Group III. The streptococcus cases were not studied as to whether or not they were of the hemolytic group.

When the aspirated fluid shows a cell count

of 60% or more polynuclear leucocytes and an organism—I believe in operating. If there are leucocytes and no organism one should not operate. The one case I spoke of as not being operated on, showed many leucocytes but no organism and cleared up without operation. I think this is rather uncommon as usually cases having many leucocytes in the aspirated fluid will, if aspirated again a few days later, show a fluid containing some organism.

I do not want to take up in detail the surgical technique that has been used in this series, but rather to speak in a general way as to what I believe to be the correct method of handling these cases.

I realize that during the last year there have been many cases of empyemas in the army camps and that many surgeons have become much interested in the subject and a great deal has been written. My impression is that in the army they finally concluded that operation should be put off as long as possible and frequent aspirations done first—I believe them to be correct provided one is going to do the old fashioned open drainage operation. I prefer early operation by an air tight closed method. An empyema that is not operated on in the early stages usually develops a definite cavity with a partly collapsed lung, more or less held down by a thickened pleura. If one can operate and drain these cases early enough one rides oneself immediately of this complication. In this case one finds instead a lung partly compressed by fluid, which will immediately expand when the fluid is let out, provided that no air is allowed to enter the pleural cavity. A lung has greater difficulty in expanding against positive pressure without artificial means, in fact, I do not believe that it can. Furthermore, in delayed operation there is more danger of complications—such as pericarditis, pyemia, and septicaemia. Also there is more chance for adhesions to form, resulting in separate pockets of pus.

The air tight closed method—or what I call the catheter suction method—is based on five very important points.

1st. Early operation.

2nd. The necessity for allowing the fluid to escape very slowly. This is important as a large amount of fluid being allowed to escape rapidly from the pleural cavity may throw the patient into great collapse and even sudden death.

3rd. The prevention of pneumo-thorax which would partly collapse the lung.

4th. The sterilization of the pleural cavity with the Dakin's solution.

5th. Suction (to get rid of all the fluid).

The operation is very simple. It can always be done under local anaesthesia. It takes not more than five or six minutes and there is no shock connected with it, and in most cases, no pain. I have done it in individuals ranging in age from one to 60 years.

The success of this method and the early recovery of the patients depends on intelligent individual after care. They should be irrigated with Dakin's solution every two hours when not asleep. Care and intelligence are necessary in doing this. When carefully done there is no discomfort or pain. In private the shortest case I had was 11 days and the longest four weeks. And this means they were entirely healed up and have not recurred. In the general hospital the average length of time was four to five weeks and the longest 10 weeks, this not including two cases that were discharged as having become chronic and were sent home for a while before having some further operation.

The progress of the treatment is determined by bacteriology. After the first week a smear is taken from the pleural cavity and the sinus, and the organisms counted under the high power of the microscope. When there is not more than one organism to three or four fields, the cavity is considered sterile. I, personally, prefer to wait two or three days more, or until there is no organism in either the cavity or the sinus—this being proved by both the cell count and cultures. Then I know that the patient is well and will remain so provided one can keep a sterile dressing over the sinus for three or four days.

It is probably safe in the pneumococcus and staphylococcus cases to consider them well when the count is down to one organism to three or four fields. But in the streptococcus cases this is not so. Every streptococcus must be gotten rid of before closing the sinus, or there will probably be a recurrence.

I do not want to give the impression that this method is a sure cure for all acute empyemas. It is not. Occasionally there is a case in which at the end of four or five weeks we find the count staying up to three, four or five organisms per field. Just why I do not know. Then under gas oxygen a rib has been resected, and a very small

cavity has always been found. These cavities have varied from about the size and shape of a hen's egg to that of a lemon, and when packed open with gauze have rapidly healed. It is perfectly safe to use a general anaesthetic at the second operation, as the patient is in good condition and no longer has a septic appearance.

Thirty-four cases in this series were operated on by this closed method. Twenty-eight recovered without further operation. Four needed a secondary operation. One case had a recurrence and one case died. Of the four needing a second operation, three promptly healed up and the fourth—a streptococcus case—left the hospital with a small drainage tube. In this case we were unable to make satisfactory progress as the patient was very difficult to handle and we hoped that by going to the country for a time he might improve more rapidly than was possible in the hospital. The one case that died I believe should not have. At the time of operation he had double broncho-pneumonia and was delirious. Following operation he improved rapidly, his delirium ceased and his pneumonia cleared up, so that at the end of 10 days I thought him well on the road to recovery. Unfortunately the electrical suction apparatus was started on him and by mistake was allowed to run for an hour and a half. At the end of this time he was in a state of near collapse and died in a few hours. I cannot give the explanation of his death. There was no autopsy performed. I suppose there was an obscure pleural reflex that tended to inhibit his heart's action. I feel that it is not safe to allow suction of the pleural cavity to be carried on without some one being present to watch it.

The other operative technique that has been used in this series is the regular Carrel-Dakinone. At the present time I believe in using this only in the small encapsulated empyemas, for the reason that it is not safe to do the closed operation as the cavity may be difficult to find and one must do an open operation in order to be sure of finding it.

There were only four cases operated on in this way. One case did very well and left the hospital cured in three weeks. Two patients required further operation for secondary encapsulated empyemas. These were the only cases of the whole series that had secondary encapsulated empyemas. The remaining case died. This case was—I think—entirely my fault as I picked

out the wrong operation. It was a man in the 50s, and I thought he was in better condition than he turned out to be. A rib was resected under gas oxygen. He promptly developed pneumonia on the other side. This rapidly spread and he died in four or five days. In thinking this case over I firmly believe I should have done the simple closed drainage under a local anaesthetic.

#### COMPLICATIONS.

This series has been remarkably free from complications following operation. And it is well that this was so, as the patients had enough to bear before operation with broncho-pneumonia, which frequently persisted for some time after operation, and all this on top of having influenza.

One case of which I have just spoken developed pneumonia on the other side and died.

One case had a pleural reflex from the suction and died.

One other case had a pleural reflex from the use of Dakin's solution and almost died, but finally recovered.

Two cases, only, developed secondary encapsulated empyemas and these have both done well following the secondary operations. This is quite remarkable to me, as during the last year army camps have reported considerable numbers of secondary encapsulated empyemas. In these reports the diagnosis was based on the x-ray findings and not on operative findings, and I believe the diagnosis open to question. In a series of 100 consecutive acute empyemas these two are the only ones that I have had.

The reflex from the pleura is a very interesting and important question, and one that must be considered in using Dakin's solution, or any other solution for irrigation of the pleural cavity. Every one realizes that the pleura is exceedingly sensitive, and irritating it may set up a dangerous reflex. One occasionally hears of a patient's sudden death from aspiration. In an air tight drainage irrigation must be done with great care. Frequently one sees patients in whom severe coughing is caused by a small amount of Dakin's solution being put into the pleural cavity. But this quickly quiets down. One patient in this series almost died while being irrigated. He had been irrigated for three or four weeks several times each day without any discomfort, and then suddenly—out of a clear sky—collapsed during the irrigation, and

this was being done by the same man and in the same way as previously.

Finally, one case had an acute appendix during the convalescence. He was operated on and promptly recovered.

No case developed pericarditis or septicaemia.

During the last two years the surgery of acute empyema has made great advances. And these are due, I believe, first to the closed suction method, and second, to the use of Dakin's solution. Of course we owe the latter to the war, but the closed method we were familiar with and had been using for some time before this country entered the war.

There may be some one here who is skeptical as to the efficacy of this method, and to him I would say that, even if it has not cured every case, yet it has a distinct contribution to make toward ultimate recovery, as it will often tide a patient over his extreme septic condition, and any operation that is needful can be done later.

I am convinced that there should have been no mortality in this series, and I have shown you how one death was due to careless use of the suction apparatus, and how, in the other case, the wrong operation was decided on.

In conclusion I would say once more that I firmly believe in early operation by means of a closed air tight suction technique done under local anaesthesia and followed by the intelligent use of Dakin's solution.

#### DISCUSSION.

DR. HALSEY BEACH LODER, Boston: I want to call attention to the similar group of cases we have had at the City Hospital. As Dr. Whittemore has set a standard for operation in empyema, it makes us sit up nights and ponder. We ought to take these results to heart.

Dr. Whittemore's results are based on early closed operation and suction apparatus and Dakin's solution. My operation is based on the fact that Dakin's solution and suction are hard to obtain outside of big institutions and my results are based on the fact that an empyema operation must be done in the home rather than in the hospital. His results cannot be obtained in the home. Our attempt to get equally good results without the use of either Dakin's solution or suction has been carried out in this way. The cases have been aspirated as soon as the diagnosis has been made or suspected—that means drawing off as much of the purulent fluid as possible. The fluid was sent to the laboratory and then an intravenous injection of serum was given and the patient's temperature dropped flat; in the course of a few days the

fluid reaccumulated in the chest but was sterile and the virulence of the infection was over. The patients were aspirated three or four times in the usual way if there was any sign of reaccumulation of fluid, and 15 ounces of fluid taken away. By the time they had been aspirated three or four times they developed a small localized empyema. Now, when you have that small localized empyema, it is sometimes hard to find it. If the doctor has been doing tapping from the first and knows where his needle will get pus, it is all right. You must either do that or have the help of stereoscopic plates, which will show you localized empyemas touching the chest wall at certain points. When the case has got to that point we resect a rib, and most of the cavities have been packed with gauze, especially the small ones, and drained, and all have healed up within six weeks.

So much for the pneumococcus cases, in which the injection of serum is used and aspiration up to the patient's tolerance until a localized empyema is developed. As to the streptococcus cases, I am rather discouraged. Those cases treated by the old rule of thumb—turn them over to the surgeon and let him operate—are sure to be pushed over into eternity. Aspiration and repeating at 24 hour intervals will tide those cases over. Closed drainage put in will help some of those cases, but I cannot but believe that in streptococcus empyema removal of the fluid is touching but a small part of the patient's infection. The streptococcus is in the chest and in the blood as well as in the lungs, and I think that the treatment is to come from the medical side or from the serological side. So far as the fluid in the chest embarrasses respiration it is a detriment.

Now a word about Dakin's solution: I have reason to believe that it is more than useless, and an element of danger is introduced by using Dakin's solution which is not Dakin's solution. In other words, Dakin's solution must be true Dakin's solution and not a guess at it.

The day has gone by when empyema is treated by rule of thumb, and that rule of thumb is that when pus can be found in the chest the surgeon is to take it out by making a hole. The day of that treatment is over. The mortality is 25% to 35%. The point now is that the empyema is to be treated at the proper time and first treated by the physician and not by the surgeon, and my word to you is to keep away the hand of the surgeon until he has learned his lesson.

## Book Reviews.

*Materia Medica.* By DR. EDWARD R. SQUIBB.  
New York: E. R. Squibb & Sons. 1919.

The 1919 edition of Squibb's *Materia Medica* presents, as have its predecessors, trustworthy information concerning the nature, quality, and uses of medicinal products. It includes an alphabetical list and description of the products manufactured at the Squibb Laboratories, including all the articles of the United States Pharmacopoeia (IXth Revision) and of the National Formulary (IVth, 1916 edition), and also many facts concerning a large number of non-official and newer remedies which are approved by the Council of Pharmacy and Chemistry of the American Medical Association. This book sets forth the origin, Latin and English titles, synonyms, physical, chemical, and pharmaceutical characteristics, and therapeutic uses of these products. The general character and arrangement of the contents of this volume are similar to previous editions, although the names of such products as have become obsolete have been omitted, and a large number of additions have been made. This book is a trustworthy compendium of the approved materia medica of today, and will be found a valuable aid to the physician and the pharmacist.

*War Neuroses.* By JOHN T. MACCURDY, M.D.  
Cambridge: University Press. 1918.

Functional nervous disorders arising in soldiers as an immediate result of conditions of modern warfare present a problem which is being regarded as increasingly important by the medical profession. The author of *War Neuroses*, with a past experience of investigation of the psycho-neurosis of civil life, has observed in British hospitals the special forms of neurosis arising from the unusual strain of the present war. He classifies the conditions of war neurosis into two main groups—anxiety states and conversion hysterias. In the former, various mental factors develop into states of anxiety which are accompanied by symptoms closely allied to anxiety in non-pathological forms. In the conversion hysteria group, there is manifested an alteration or dissociation of consciousness regarding some physical function. Anxiety states develop most frequently among officers, the conversion hysteria among privates and non-commissioned men—a fact which may be explained by differences in education and responsibility. The cases described by the author in this book show that even when concussion or fatigue is the main agent in producing the condition, the mental elements are the determining factors in the development of war neurosis.

PRESIDENT OF THE ROYAL COLLEGE OF PHYSICIANS OF IRELAND.—Dr. James Craig, professor of practice of medicine in Trinity College, Dublin, has been elected president of the Royal College of Physicians of Ireland.

*Manual of Laboratory Diagnosis.* Compiled by HERMAN JOHN BOLLINGER, S.B., M.D. Baltimore: Medical Standard Book Company. 1919.

This *Manual of Laboratory Diagnosis* has been compiled from lectures given by Drs. Miller, Batchelor, Evans, Bactjer, and Guthrie, of Johns Hopkins Medical School, and presents in summary form lectures of these instructors during the past year. These notes are somewhat limited and the methods are subject to change with time; yet the essential subject matter covered in the lectures on urine analysis, examination of the gastric contents, sputum, feces, parasitology, and hematology, clearly outlined and illustrated, is of considerable value. Although not an exhaustive treatise of the subjects presented, the convenient outline form in which this book is written makes it an unusually practical and helpful guide for teaching and for comprehensive review.

*Studies from the Rockefeller Institute.* Volume XXX. New York: The Rockefeller Institute for Medical Research. 1919.

Reports of investigations carried on at The Rockefeller Institute for Medical Research have been collected and published in Volume XXX of *Studies from the Rockefeller Institute*. This work contains reprints of significant studies which have been published previously in various medical journals.

The contributions of greatest interest, perhaps, are the reports of Jacques Loeb in the field of experimental biology. In an article discussing the chemical basis of axial polarity in regeneration, he describes experiments which seem to prove that axial polarity in the regeneration of a stem is due to the fact that the apical bud and apical leaf send out substances toward the base of a stem which inhibit the buds from growing out; he expresses the belief that the reason for the most apical bud coming out first may be due to the fact that it will be the first to be free from these inhibitory substances. A study of the chemical mechanism of regeneration of plants gives evidence that the inhibiting action of the stem upon the shoot production in the leaf is probably due to the absorption of material from the leaf by the stem. In a third article, Loeb considers the chemical basis of correlation, and cites experiments to illustrate the production of equal masses of shoots by equal masses of sister leaves in *Bryophyllum calycinum*. In a study of the ionization of proteins and antagonistic salt action, he describes a new method which he has discovered which will allow the study of the effect of neutral salts on gelatin. Loeb has reported, also, his experiments on the sex of parthenogenetic frogs. He succeeded in raising twenty leopard frogs, including both sexes,

from unfertilized eggs to the age of from ten to eighteen months, some of them with full normal development.

In addition to these interesting experiments by Loeb, among other articles particularly worthy of attention are the following ones:

"Fluid Substitutes for Transfusion after Hemorrhage," by Peyton Rous and George Wilson; "Further Studies on the Properties of Pure Vaccine Virus Cultivated *in Vivo*," by Hideyo Noguchi; "Methods for Intravenous Injection of Guinea Pigs," by Rous; and "Free Antigen and Antibody Circulating Together in Large Amounts," by Rous and Oswald Robertson.

This volume contains many other important articles, illustrated by tables and plates, in the fields of pathology and bacteriology, physiology and pharmacology, chemistry, experimental biology, and animal pathology, and reports of the work of the Hospital of the Rockefeller Institute.

*The Johns Hopkins Hospital Reports.* Volume XVIII. Baltimore: The Johns Hopkins Press. 1919.

Among the most interesting papers included in Volume XVIII of the Johns Hopkins Hospital Reports, are a number of contributions by M. C. Winternitz and his collaborators. His experiments, illustrated by charts, on the effect of feeding glands of internal secretion to chicks are of interest in spite of conflicting results. Studies made by Winternitz and H. C. Schmeisser on the relation of fowl typhoid to leukemia of the fowl give evidence of a close relationship between these two conditions. In an article, illustrated by plates, describing "Hyaline Degeneration of the Islands of Langerhans in Pancreatic Diabetes," Winternitz discusses experiments with animals and those dealing with the histopathology of the human pancreas in diabetes mellitus. Of considerable interest is his report on "Generalized Miliary Tuberculosis Resulting from Extension of a Tubercular Pericarditis into the Right Auricle." A paper by T. R. Boggs and Winternitz reports an interesting case of acute hypophysitis, arising by extension from a purulent sphenoidal sinusitis and associated with definite signs of an interference with the function of the gland. "The Role of the Autopsy in the Medicine of Today," by Winternitz, presents convincing evidence of the importance of post-mortem examinations. Excellent plates and charts illustrate "Experimental Nephropathy in the Dog," by Winternitz and W. C. Quinby; and the observations of Winternitz and Schmeisser on "Mesarteritis of the Pulmonary Artery" are significant. These contributions, together with others by different investigators, make this volume one of unusual interest.

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## ORGANIZATION OF THE MEDICAL PROFESSION.

It is probably true that in no state of the Union are the members of the medical profession of a higher type than they are in Massachusetts. In their care of the needy and in their relations to one another, the doctors of this Commonwealth can be relied upon to do what is right. There is lacking, however, so far as the writer is able to judge, a sense of public responsibility. This is no doubt due in part to a dislike of publicity, in part to the fact that the men at the head of the Massachusetts Medical Society have been of so fine a stamp that the members of the Society have been well satisfied to leave such matters in their hands. Nor is there any doubt that the State Committee on Legislation, within whose province most of these questions fall, has fulfilled its duties most faithfully. Would it not be

better if their light were not hid quite so completely? Would it not be advantageous to the public and to the medical profession alike if the latter were kept more fully informed in regard to the questions at issue, and were welded into an instrument more adapted to hewing public opinion into the proper shape?

In this connection it is interesting to note the ideas which prevail on the other edge of our country. President H. P. Marshall of the Washington State Medical Association, in his address before the thirtieth annual meeting of that body, emphasizes the necessity of organization in medicine. He points out that at present the officers of the state association change every year, and are therefore unable to formulate and carry out any instructive policies. He suggests the formation of an Organization Committee. This committee should consist of a State Organizer elected every three years by the House of Delegates, and of one man selected from each county by him. "This committee should have full power to work out all medical policies, being governed by the instructions of the House of Delegates. In the absence of a specific instruction on a given question, the committee of organization shall decide it."

Dr. Marshall believes that by the efforts of such a committee vastly more influence could be exerted upon public opinion than is possible without organization. Such a committee would be in fact a publicity committee, which would present to the medical profession the facts upon each important question and would thereby arouse their interest in that question. It is unlikely that this committee would succeed if it simply issued an edict that such a measure was wise or unwise, and must, therefore, be adopted or be killed.

Whether or not one agrees with the details of Dr. Marshall's plan—and there are certain objections to giving to one man a position of so much power—one cannot disagree with his reasons for the necessity of organized effort by the medical profession in behalf of proper legislation and of wise medical policies.

## THE UNITED STATES TRAINING CORPS FOR WOMEN.

A TRAINING camp for women was established last August at Lake Geneva, Wisconsin. This camp was an outgrowth of the work conducted

in Washington during the war by Miss Sussanna Coeroff, who instituted courses in physical training for women employed in the government offices. Nearly four thousand women took part in these exercises. As a result the U. S. Training Corps for Women was formed.

At Camp Geneva, 147 women, representing twenty-two states, and ranging from twenty to sixty-five years of age, were enrolled. The training was not for militaristic ends; it was intended simply to improve physical health and vigor. The U. S. Training Corps has four definite ends in view.

1. To build up the health and strength of the women in camp by teaching correct posture, correct breathing habits, correct habits of walking, setting-up exercises and military drill followed by complete relaxation after every exercise period.

2. To train teachers who will go back to their localities and conduct classes in the public parks or other suitable places, or in any of the large industrial organizations. Many of the large industrial institutions in Chicago and throughout the country have already interested themselves in this movement and are making provisions to have this training for their employees next year.

3. Each girl returns to her home to use her influence in having the same sort of training given to the school children in the public schools with fifteen-minute open air exercises each day that the weather will permit.

4. And most important from the standpoint of public health, each woman returns to her community pledged to help the local state, county, and city health organizations.

It is not at all unusual to hear ex-service men say that they never felt so well as when they were in the army. There is no reason why a similar life in camp adapted to women's needs would not yield to them the same satisfaction.

Change of environment, new companions and arduous exercise in the open air, cannot fail to be of benefit, especially to those girls whose work keeps them the rest of the year indoors.

associations of the country has been suggested by Surgeon General Blue of the U. S. Public Health Service in a letter sent to State and City Health Officers, to the head of the American Red Cross, The American Public Health Association, the American Medical Association, the National Tuberculosis Association, the International Health Commission, the National Safety Council, the American Child Hygiene Association and other health agencies. Certain phases of the work, such as those relating to cancer, tuberculosis, and venereal diseases, public health nursing and medical supervision of school children, are of interest to all sections of the country. Other problems are more vital in certain localities. The program will be so arranged as to give due consideration to matters of local interest, as well as to those of wider scope.

To those endeavoring to improve the health of the nation, the record of the years 1900-1917 offers much encouragement. The death rate of typhoid fever fell from 33.8 per 100,000 in 1900 to 13.4 in 1917; that of diphtheria from 35.4 to 16.5. In 1900, 190.5 per 100,000 died of tuberculosis; in 1917, 146.4 died from that cause. So many of the causes of death are preventable that it seems not too sanguine to hope that the next twenty years will witness an equal decline in the number of deaths from communicable disease.

#### MEDICAL NOTES.

10,245 NURSES IN ARMY SERVICE OVERSEAS.—A final report made by Miss Julia C. Stimson, director of the Army Nursing Service abroad, shows that between May 2, 1917, and May 31, 1919, 10,245 nurses out of a total of 21,480 enlisted for war service served overseas. Of this number, three were wounded in action and 266 died while on duty. The first six detachments of nurses sent to France replaced nurses in British hospitals. The work of the American women became very heavy in July, 1918, with their own army. Between July 13 and November 11, it was not at all uncommon for nurses to work fourteen and eighteen hours a day for weeks at a time, and some hospitals with only seventy or eighty nurses cared for patients to the number of 2100. On the day of the signing of the armistice 184,421 American soldiers, sick and wounded, were in hospitals, and there was a shortage of 6,925 nurses, reported to be

#### A NEW MOVE TO COÖRDINATE HEALTH ACTIVITIES.

A CONFERENCE to be held in Washington to coördinate the work of the various public health

due to the fact that it had not been possible to secure adequate transportation of the nurses.

#### TAR AS THE CAUSE OF INDUSTRIAL DISEASE.—

Attention has been called recently to the fact that tar is capable of producing a skin disease which properly should be classed among the avoidable industrial diseases. It appears to have been recognized in England, Germany, and France. The disease manifests itself in the obliteration of the glandular orifices of the skin and in succeeding lesions, but yields readily to treatment.

ANTIRABIC INSTITUTE OF CAIRO.—The Antirabic Institute of Cairo was founded as a private association in 1899, and was supported by the Italian Benevolent Society until 1906, when it was taken over as one of the divisions of the Egyptian Health Department. It consists of a building containing eight service rooms on the entrance floor and the director's residence above. It is equipped with a thermostat designed especially for tropical climates, two hot-air sterilizers, one steam sterilizer, an autoclave, a good microscope, and instruments for dissection and inoculation. During the first eight years, the Institute treated 2221 persons who had been bitten by canines, equines, felines, and human beings. Fifty-five persons died.

After 1906, the Institute continued its former work, with additional equipment and some special technique. During the last eleven years, 7382 persons have been treated by the Cairo Antirabic Institute, with a crude mortality of 2.37 per cent. and a corrected figure of 0.78. In both periods, dogs were responsible for between eighty and ninety per cent. of the bites.

TUBERCULOSIS IN GERMANY.—In a recent issue of *The Medical Press*, there have been published extracts from a report of two Americans, Miss Jane Addams and Dr. Hamilton, who have described conditions as they saw them in Germany a week after the signing of peace. The terrible results of the prolonged food blockade on the German people are particularly shown by the increase in tuberculosis in German cities. Germany has lost the progress of years in the control of this disease, and now is in a condition no better than in the eighties, before the discovery of the tubercle bacillus by Koch. The rate increased slightly before the tightening of

the blockade and rapidly after it, indicating that the increase in this disease was due to lack of food and not to other incidents. A comparison of figures before and after the war is significant: in 1914, deaths from tuberculosis in German cities of over 15,000 inhabitants was 40,374; by 1916 it had risen only to 48,779, but by 1917 it was 67,800. It is probable that the rate for 1918 and 1919 will prove to be still higher. The effects of lack of food on tuberculosis have been so great that German physicians are beginning to regard tuberculosis not as an infectious disease, but as a disease of nutrition.

A visit to the hospital of the Charité connected with the University revealed the fact that fully half of the children were tuberculous, due both to increased infection from overworked and underfed mothers and from fathers who have returned from the front with tuberculosis, and to the loss of resistance among the children themselves because of partial starvation. The far-reaching effects of these conditions cannot be estimated at present, for it is likely that each year for the next twenty years will show a higher sickness rate from tuberculosis in Germany than that country has known for decades. Although many cases will not develop until later in the lives of these children, there are already many examples of the most terrible forms of the disease. Not only in the Charité, but also in the hospitals of Halle, Leipzig, and Frankfurt may be found children with pronounced tuberculosis of the glands, with tuberculosis of several bones at once, and cavity formations, which ordinarily occur only among older people. To add to the tragedy of the situation, physicians could only recognize their own impotence, fighting a fight which they could not hope to win without being able to provide nourishing food to their patients.

Among the adult population there have developed a considerable number of cases of the so-called galloping consumption, which was of rare occurrence in Germany before the war. This is not confined to hospital patients, for one physician stated that at one time he had thirty cases in his own private practice among the well-to-do.

The City Orphanage in Berlin, although ordinarily it has taken under its charge only healthy children, is forced now to accept the tuberculous and rachitic. Before the war, the Pirquet skin test was positive in ten per cent. of the children; now it is positive for thirty



per cent., and actual illness has increased five-fold. In Halle there is ten times as much skin tuberculosis as before the war. In Frankfurt there are cases of pulmonary tuberculosis even among babies. The only way of checking this alarming increase in tuberculosis is by ensuring the sufferers a sufficient amount of nourishing food. One of the agencies which is helping in this relief work is the Save the Children Fund (326, High Horn, W.C.I.).

**THE WELSH NATIONAL MEDICAL SCHOOL.**—It has been announced in *The British Medical Journal* that the proposal of the Royal Commission,—that the Welsh National Medical School be made a separate constituent college of the University of Wales,—has not met with the approval of the University, for the reason that it is deemed undesirable from an educational point of view to separate the medical students from the general body of students and to discourage intercourse between the professors in the medical and other faculties. It is realized, however, that it is of great importance to organize the medical school on a national rather than on a local basis; in order to accomplish this, it has been proposed that the college council shall be the chief governing body of the college of medicine, but that wide administrative and executive functions and powers shall be delegated to the board of medicine. It has been suggested that the "unit" system be adopted with regard to the chairs and lectureships in the faculty of medicine: the medical unit to consist of two full-time teachers, one professor, one assistant professor, and part-time lecturers on toxicology, forensic medicine, and dermatology; the surgical unit to include three full-time teachers, one professor, two assistant professors, and part-time lecturers on orthopedics, genitourinary surgery; ophthalmology, and diseases of the ear, nose, and throat; the unit of gynecology and obstetrics to have one full-time professor and one full-time assistant professor. It has been proposed that there be also an electrical department with a medical superintendent, and clinics for psychiatry and neurology, pediatrics, dermatology, and dentistry.

**BUBONIC PLAGUE IN NEW ORLEANS.**—FOUR cases of bubonic plague, two of which resulted in death, have been reported recently from New Orleans.

## Miscellany.

### THE EPIDEMIOLOGY OF PLAGUE.

FROM an issue of the *Lancet* comes the following statement concerning plague:

"Bubonic plague is endemic in the British Empire and its presence in normal times is a constant menace to the public health of the community. Under war conditions, which necessarily entail increased movement of population with less efficient means of control, naturally the risk is increased." Dr. John Brownlee's contribution on Feb. 8th at the Royal Society of Medicine to the theory of plague epidemiology is therefore specially welcome. As statistician to the Medical Research Committee he dealt with the broad aspect of the whole subject, showing in the first instance that the great bulk of plague epidemics in such large towns as London, Bombay, Calcutta, and Sydney during the last three centuries have had certain common features. He continued:

"These epidemics have been symmetrical in shape and their form essentially constant during the whole period. The same form of epidemic has occurred among rats. Two different theories may be entertained. Assuming infection to be proportional to the number of acute cases at any moment, the epidemic ends, on the first hypothesis, from lack of susceptible persons and, on the second, from loss of infecting power on the part of the organism. In Bombay the first hypothesis is numerically consistent with the data for brown rats, but not in the case of the black variety. In man the form of the epidemic shows points of difference demanding some secondary hypothesis, e.g., that disease foci when present in large numbers are more effective in spreading the disease than sparse ones; following the law which connects density of population and death-rate. In the United Provinces of India, where marked variations in weather occur from year to year, the November humidity is closely associated with the humidity of succeeding months and with the number of plague cases in the epidemic, the exact relationship being that the logarithm of the number of cases is proportional to the humidity. Periodicities independent of the solar year probably exist in Poona, Cawnpore, and other towns. Weather conditions varying

from month to month do no more than modify the form of the natural epidemic.

"The broad epidemiological aspect would also be of great interest in regard to the outbreak of pneumonic plague reported from China.

"Early in January it was officially announced from Peking that pneumonic plague had broken out on the borders of Mongolia, and that the infection had spread into Shansi, one of the four northern provinces of China. The disease was then threatening to extend southwards and eastwards into the populous province of Chih-li, in which is situated Peking, the capital of the Chinese republic. The present outbreak resembles closely that which, early in 1911, swept over the Mongolian border into Manchuria, and in little more than three months carried off between 50,000 and 60,000 victims. That epidemic, like the present one, began in the cold season, and both appear to have been aided in their development by the exceptional severity of the winter. Both outbreaks had their origin on the Mongolian border, which is a recognized endemic area of plague, and the endemicity is said to be associated with the presence of the disease in a species of marmot, called the tarbagan, found there in large numbers and hunted in the autumn months for the sake of its fur, now in great demand. In both outbreaks the infection spread rapidly along the lines of railway communication, and in neither of them was the diffusion assisted by the agency of rats or fleas, the disease spreading alone by personal contact—that is, by the inhalation of the droplets containing plague bacilli coughed up by those suffering from the malady. Owing to the extreme cold, overheating and overcrowding of houses are promoted, doors and windows are kept closely shut, chimneys and crevices are stopped up to exclude the outer air. A case of pneumonic plague, shut up with a crowd in such circumstances of overheating, lack of ventilation, and insanitation, would infect all exposed. In the Manchurian epidemic every person attacked by the disease succumbed, there being no instance of recovery on record. Should pneumonic plague become epidemic, as seems probable, in the populous province of Chih-li, the consequences are likely to be serious, for countless numbers of the inhabitants are suffering from severe privations, the result of recent floods, and cannot be in a condition to offer much resistance to the onset of a grave

infection. At the beginning of the outbreak the Chinese Government was strongly urged to take immediate measures for stopping the spread of the disease, and accordingly a medical commission, with Dr. Wu-Lien-Teh, Director of the North Manchurian Anti-Plague Service as leader, was dispatched to the Shansi-Mongolian border. On arrival they were, unfortunately, met with the undisguised hostility of the people, whose unreasonable attitude was largely supported by the local Government officials and by the military. It is to be hoped that the Chinese Government will support the recommendations of the Medical Commission, led by Dr. Wu, and that steps will at once be taken to bring to book the Shansi officials, and other parties concerned, who permitted the ill-treatment of the medical commissioners sent to assist the inhabitants of the province in averting an epidemic which is fraught with such wide-reaching consequences."

#### SOCIETY NOTICES.

SUFFOLK DISTRICT MEDICAL SOCIETY.—A meeting of the Medical Section of the Suffolk District Medical Society will be held at the Boston Medical Library, No. 8 The Fenway, at 8.15 p.m., on Wednesday, Dec. 17. Papers: "The Relative Value of Some Modern Methods of Diagnosis and Treatment of Chronic Peptic Ulcer," by Dr. Franklin W. White; "The Diagnosis and Treatment of Diseases of the Colon," by Dr. Henry F. Howes; Discussion will be opened by Dr. George W. Holmes and Dr. Daniel F. Jones.

EDWIN A. LOCKE, M.D., *Chairman*,  
GEORGE R. MINOT, M.D., *Secretary*.

SPRINGFIELD ACADEMY OF MEDICINE.—The December meeting of the Academy will be held on Tuesday evening, December 9, 1919, at 8.30 o'clock.

Report of a case of leprosy by Dr. S. J. Paul of Springfield.

Address, "Lung Surgery," by Dr. Carl Eggers of New York, recently returned from Government service.

L. D. CHAPIN, M.D., *Secretary*.

WORCESTER DISTRICT MEDICAL SOCIETY.—The next regular meeting of the Society will be held on Wednesday, December 10, at 4.15 p.m., in Grand Army Hall, 55 Pearl Street, Worcester.

Communications:  
"Gas Bacillus Infection in Civil Life," Dr. Ernest L. Hunt.

"The Standardization of Clinical Thermometers, with demonstration," Thure Hanson.

DR. WILLIAM J. DELAHANTY, *President*,  
GEORGE A. DIX, *Secretary*.

#### RECENT DEATHS.

DR. CHARLES FERMONT TAYLOR died recently at his home in Philadelphia. Dr. Taylor was born in Attica, Indiana, in 1856, and was graduated from the Central College for Physicians and Surgeons, in Indianapolis, in 1880. He practiced in Indiana for a few years, and later became editor of *The Medical World and Equity*.

# The Boston Medical and Surgical Journal

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## Address.

ADDRESS GIVEN AT THE PUBLIC HEALTH CONVOCATION, SPRINGFIELD, MASS., NOVEMBER 21, 1919.

By *ALFRED WORCESTER, M.D.*, WALTHAM, MASS.

WE are just beginning our ter-centennial celebrations of the settlement of New England. This year we shall be thinking of the Pilgrims of Plymouth, and soon we shall be reminded of the Puritans of the Massachusetts Bay settlements.

Brave people they all were and great were their hardships. What is most pathetic in their annals is their frightful sufferings and mortality from disease. At Plymouth, and eight or nine years afterwards at Salem, full half of them died during the first year of the settlement. Some of these sicknesses, especially at Plymouth, were the unavoidable consequences of starvation and exposure; but undoubtedly the greater part of the disaster was from diseases now known to be preventable. It is indeed a pitiful story.

Although in succeeding centuries there have been brilliant discoveries in the treatment of some diseases, the great advance of medical

science during these later years has been in the discovery of the parasitic origin of many of our common diseases, and the means of preventing them.

Formerly these diseases, even if known to be contagious, were considered as mysterious afflictions from on high, which our forefathers were bidden meekly to accept—along with their predestination to hell. Perhaps that association of ideas led to the later equally absurd belief in the efficacy of the fumes of burning sulphur as a disinfectant.

Laugh as we may at the ignorance of our predecessors regarding the true nature of these diseases, what is the good of our modern knowledge if we do not apply it! What comfort is there in knowing that most of the sicknesses, yes, and most of the deaths of our friends and neighbors might have been prevented! What advantage have we over our forefathers who in darkness walked through the valley of the shadow of death!

True, some of the awful diseases that our forefathers suffered have been stamped out. In these meetings you will hear how other diseases might likewise be exterminated. For, in this fight against the disease-producing parasites, the medical profession and our health officials can now point out the way. But suc-

cess in the fight depends upon the intelligence and determination of all our citizens.

In Prussia certain diseases during later years were stamped out by government orders. Before a peasant's family could eat their pig, the carcass had to be carted to the sanitary station for microscopical proof that there was no trichinosis in the pork. Here a farmer, if he chooses to take the risk, can not only let his children contract that disease, he can even let them drink tuberculous milk. This is a free country.

In the Franco-Prussian War, a half century ago, the German soldiers were almost decimated by the smallpox. In the last war, because of compulsory vaccination there was no smallpox except in those armies of the half-civilized nations where vaccination was not required. The same was true of typhoid fever.

In time of war, even in this country, the people accept all sorts of arbitrary rulings. But in peace times we Americans are jealous of our liberty. And yet, even if the right to be sick and to die as he pleases be granted to the individual, he certainly has no right to indulge in any sickness or to refuse precautions against it, if such a course on his part endangers the health or life of his fellow-citizens.

This is where the necessity of an intelligent public comes in. What we all want, we in this country can have. For instance, we can decide what sort of a Governor we shall have. And we can depend upon our Legislators to enact the sanitary laws that we want. But we must make our wants known. Besides spreading information regarding personal hygiene, this Convocation is held for the double purpose, first, of making plain the meaning and necessity of what sanitary laws we already have and also of those that the Legislature will be urged to enact; and, second, of securing for the enforcement of these laws the hearty coöperation of the public.

Let me give you one glaring instance of the need of this public support. I have already referred to the smallpox as one of the diseases that has been completely stamped out in countries that employ universal vaccination. And yet there are even today some misinformed people who strive for the repeal of our laws requiring that safeguard. One of the grounds of their opposition to compulsory vaccination is that it is an interference with individual liberty; another of their tenets is that,

as there is no such disease now prevalent, vaccination is no longer needed. Their fanaticism, I submit, is no more fatuous than that of the earlier opponents of vaccination on the ground that it was a sacrilege thus to prevent the punishment that the Almighty so plainly intended for his children.

But I am taking too much of your time. I am here only to speak for the medical profession of Massachusetts, to bring their greetings, and to assure you of their hearty approval of this great public health movement.

Our professional activities, which formerly were directed almost solely to the cure of the sick, are now more and more devoted to disease prevention. The time may come when, as in China, the pay of the family physician is continued only while the family is well; but when any member of the family is sick the physician's salary is interrupted.

## Original Articles.

### TUMORS OF THE ANTERIOR SURFACE OF THE SACRUM.

CASE I. CHORDOMA.

CASE II. SACRO-COCYGEAL DERMOID.

By FRED B. LUND, M.D., BOSTON.

LAST winter the writer was consulted by two women, both of whom presented tumors of the anterior surface of the sacrum. Both were rare conditions: one a chordoma of the sacrum; the other, a congenital cyst of large size. Both were dealt with by the Kraske method of approach and the interesting points both in diagnosis and treatment which they present render them worthy of a brief report and discussion. Both were referred to the writer by Dr. N. S. Hunting of Quincy, in whose practice they occurred, and to Dr. Hunting and the Quincy Hospital the writer is indebted for the post-operative records.

CASE I. A. N., aged 60. Previous history unimportant. Had suffered for two years from pain and pressure symptoms over the sacrum and pain in the rectum. There had been some interference with the functions both of the rectum and bladder with occasional incontinence of feces and urine.

In December, 1918, I found a rather thin woman of healthy appearance and good color. Vaginal and rectal examination disclosed a tumor the

size of a small mandarin orange sessile on the anterior surface of the sacrum. The tumor was uniformly smooth, rounded, elastic to the touch, and rather hard. There was no adhesion to the rectal mucous membrane which moved freely over it. The examining finger could reach above it and feel the normal sacrum. It shaded off rather to the right and appeared adherent to the tuberosity of the right ischium. The writer made a diagnosis of sarcoma and was disinclined to operate because the tumor appeared to have extended into the right pelvic wall, and it was thought, although the sacral portion of the tumor might be removed by the Kraske procedure, its attachment to the ischium and lateral pelvic wall rendered it really inoperable. The patient was referred to Dr. Robert R. Greenough at the Huntington Hospital for consultation with regard to the possibility of radium treatment. Dr. Greenough felt that if sacral resection were done and possibly partial removal, the radium treatment might possibly be attempted thereafter. Subsequent to this consultation her pain and incontinence grew worse and recognizing that the prospect of cure was remote, she begged for operation for relief.

She was admitted to the Quincy Hospital on February 4th, where rectal examination showed that the mass had increased somewhat and extended from just above the sacrococcygeal joint upward to the vertebra prominens, and laterally to both ischiatic rami. There was also slight swelling and oedema over the back of the sacrum. On February 5, with Dr. Hunting's assistance, I made a vertical incision over the sacrum, swinging to the right at the upper end, purposing to follow Kraske's procedure. We found that the tumor, which was clear, and of gelatinous consistency, had perforated the sacrum and spread out on its posterior surface. It had replaced a good part of the sacrum and the finger introduced into it went right through the latter and into the mass in front, which was much larger than we had believed. The tumor and a great part of the sacrum were removed with the finger and a large curette, care being taken to push the rectum forward and avoid injuring it. The tumor involved the main surface and right pelvic wall and though a very large quantity of gelatinous tissue was scraped out, it was obviously impossible to remove it all. Very profuse hemorrhage made the operation difficult

and obliged us to terminate it quickly and stuff the cavity with gauze.

She rallied well. The gauze was removed in a few days and for the first week she ran a high temperature and the discharge from the wound was foul. Then her condition began to improve. On March 4, she was up and about but gained slowly. The wound healed down to a shallow cleft. She went home and gained slightly after returning home. It was not thought best to attempt radium treatment since we felt there was very little chance to benefit from it. While still apparently gaining she died rather suddenly on April 13, 1919. There was no autopsy. An examination of a specimen by Dr. J. Homer Wright showed a tumor consisting largely of colloid material in which were imbedded strands of cells. These cells were regarded as representing those forming the notochord.

The term chordoma is properly applied to growths arising from the remains of the tissue of the notochord, in the center of the intervertebral discs. They consist of vacuolized cells suspended in a gelatinous matrix, the vacuolization resembling that occurring in chordoma.

The following account of their pathology is taken from an interesting article in the BOSTON MEDICAL AND SURGICAL JOURNAL, May 22, 1919, by Ernest M. Daland, M.D.

"H. Müller has shown that other remnants of the notochord are frequently found at post-mortem—chiefly at the base of the skull and on the coccyx. Virchow describes a series of such growths under the name of *eechondrosis physalifera*, considering the vacuolation that of *chondromata*. Ribbert proved that they were the proliferated remains of the notochord. In 2% of a series of cases, he found remnants in the bony tissue beneath the dura of the *clivus Blumenbachii*,—that portion of the sphenoid bone which is continuous with the basilar groove of the occipital bone. Ribbert further demonstrated pedicles connecting them with the bone, within which there was similar tissue. Growths of this nature have also been demonstrated on the *dorsum sellae*, the *hypophysial fossa*, and more rarely, on the sacrum.

"Hence those notochordal tumors or *chordomata* have, until recently, been mere pathological curiosities. With the reporting of several malignant *chordomata*, their clinical signifi-

cance has become of more importance. In a malignant chordoma, the cells tend to differentiate into the syncytial type of vacuolated cells, which are typical of adult notochordal tissue. Usually foetal, adult, and intermediate types are to be found in the same tumor."

According to Daland, sixteen cases of chordoma have been reported clinically. He reports the 17th case operated upon by Dr. C. A. Porter, where a chordoma arising from the base of the skull caused headache, deafness, hoarseness, and other symptoms, from pressure on the nerves at the base of the skull. Her symptoms were relieved and seven months after operation her headaches had entirely disappeared, but there was a recurrence of the mass in her neck.

Ten of the sixteen cases had their origin at the base of the skull, one from the anterior surface of the cervical vertebra and five occurred in the sacrococcygeal region. Of the five, only one had been operated upon without recurrence. Of the tumors at the base of the skull only one case did not recur after operation and in only one of the sacral cases was operation not followed by recurrence. Tumors of the base of the skull naturally cause paralysis from pressure on the cranial nerves and spreading everywhere infiltrate the skull and vertebrae. The symptoms caused by coccygeal tumors produce pressure symptoms upon the rectum, sometimes partial occlusion of the rectum and sometimes, as in our case, incontinence of feces and urine from actual involvement of the sacral plexus in the diseased tissue.

For an excellent bibliography the reader is referred to Dr. Daland's article.

CASE 2. Sacrococcygeal tumors, the so-called ventral tumors of the sacrum, are extremely interesting from an embryological point of view. Here occur dermoid cysts, teratoma and mixed tumors. They differ from the common coccygeal cysts on the posterior surface of the sacrum known as pilo-nidal sinuses, in size and complication, both in their histological structure and the symptoms which they produce. Dermoid cysts and teratoma of the other parts of the body occur along the branchial clefts in the head and neck and in the mediastinum, while perhaps, as is natural, their common seat is in the ovary and testicle. Those occurring in front of the sacrum are connected with the dorsal canal, the chorda dorsalis and the neurenteric canal. This following brief statement of the embryology is taken from an

interesting article by Arthur Ayer Law, *Ventral Tumors of the Sacrum (Surgery, Gynecology, and Obstetrics, 1913, xvii, 340.)*

"When, in early embryonic life, the ectoderm forms the caudal intestine, the canal dorsalis and chorda dorsalis; the mesoderm the connective tissue, muscles, vertebrae and blood vessels; and the ectoderm the primitive streak, medullary tube and its vestiges, the central canal of the spinal chord and the primitive alimentary canal are continuous around the caudal extremity of the notochord. This passage, which brings the developing gut and cord into communication, is called the neurenteric canal.

"When the proctodeum invaginates to form part of the cloacal chamber, it meets the gut at a point in front of and some distance above the place where the neurenteric canal has its opening into it; therefore there remains, for a period, a part of the gut down behind the anus, called the post-anal gut. This is later obliterated, as is the neurenteric canal.

"Considering the complexity of the embryonic tissues forming the caudal section of the trunk axis and their perfect evolution ere they arrive at maturity, we can understand how many and varied deviations from the normal are possible; indeed, the marvel is how we so frequently escape the pathological forms."

The sacrococcygeal dermoids vary very greatly, ranging from the simple dermoid cyst such as is the case reported in this paper, to cysts containing connective tissue, muscle fibre, hair, teeth, nerve tissue, glands, skin, intestinal remnants, cartilage and bone, even rudimentary or special organs. Practically all of these tumors are definitely encapsulated and appear to arise from the pelvic connective tissue. Some of them are found on rectal or vaginal examination, others may extend down into the perineum and cause an external tumor. They have been found hanging down from the body as a sacral appendage. Sometimes they have ruptured into the bladder, vagina, and rectum, and even, as in one case reported by Keen and Coplin, opening between the sacrum and coccyx. They may simulate uterine fibroids, ovarian cysts, intra-ligamentous cysts or anterior spina bifida and give rise to symptoms of pressure on neighboring structures. In married women they interfere with coitus, and in Law's case such a tumor so obstructed labor that a panhysterectomy was done under the impression that the tumor was a fibroid in the cervix. During the

operation the correct diagnosis was made and the tumor subsequently removed by means of Kraske's operation. The tumor consisted of rapidly growing connective tissue with a nest of embryonic cells.

The case that I have to report is a young woman of 24, who had suffered since marriage, or about two and a half years, from pain in the left side and middle of the back, constipation, indigestion, and painful coitus. The pain was worse just before the menstrual periods. She had never become pregnant. Menstruation had not appeared at all until she was twenty-one years of age. Examination showed a very large cyst on the anterior surface of the sacrum, pushing the rectum and posterior rectal wall forward, filling the hollow of the sacrum to a point beyond the reach of the finger. The tumor was soft, fluctuating, evidently a very large cyst. The uterus could be felt to be in normal position, free and entirely unconnected with the tumor, being separated from it by the rectum. X-Ray showed a bifurcation of the tip of the coccyx. The late appearance of menstruation and the deformity of the coccyx shown by the x-ray both suggested that the cyst was a congenital dermoid or teratoma.

At the Quincy Hospital on February 21, I made a Kraske incision over the coccyx and lower sacrum, removing the former and the lower portion of the latter. Beneath was found a thin walled sac which was adherent to the periosteum of the coccyx and was opened during its removal. An enormous amount of cheesy material in large flakes the size of lima beans escaped from the opening. The greater portion of the sac, which was thin, was dissected out, but it was impossible to separate the deepest portion of it from the rectal wall to which it was adherent. After removing as much as possible of the wall of the sac, the cavity was wiped out with tincture of iodine and the wound, drained, after being partly closed with sutures of silkworm gut. The subsequent history was uneventful and on March 9 she went home, the tumor having entirely disappeared and the wound being almost healed. Since then Dr. Hunting has informed me that she has continued to do well as far as the cyst is concerned and there has been no recurrence. The pathological report by Dr. F. B. Mallory showed the cyst lined with epidermis in which there were no evidences of sebaceous or other glands. The contents consisted of masses of cornified epi-

thelium and cholesterol crystals. The diagnosis was sacral epidermoid cyst.

It is interesting to note that the symptoms in this case were entirely of an obstructive character, due to the blocking of the pelvic canal by the tumor and not as in the first case due to actual involvement of the nerves in a malignant growth. This condition resulted in the first case, as noted in the history, in incontinence of urine and feces. The symptoms, then, in the first case were paralytic and in the second case obstructive. The two together are interesting examples of two rare forms of tumor of the anterior portion of the sacrum.

In Dr. Law's article will be found a more complete description of the embryology and an excellent list of references.

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#### REPORT OF THE STUDY OF THE CHILDREN OF ROXBURY BY THE BOSTON CHILD WELFARE COMMITTEE OF THE WOMEN'S PUBLIC SERVICE COMMITTEE.

THE war-time program suggested by the Children's Bureau of the Department of Labor at Washington was entered upon in 1918. It began in Boston, as throughout the country, with a test of the weight and height of children under six years of age. Under the direction of the Child Welfare Committee of the Boston Public Safety Committee, the Campaign was carried on by volunteer workers during the first three weeks of May, 1918. According to the Health Commissioner's estimate, about half the children of pre-school age, or, 35,712 were weighed and measured and 5,000 of the children were found to be from 10 to 16 per cent. under weight, according to their age.

Although the committee realized that a campaign carried out by volunteer workers could not have definite, scientific results, the figures were so significant that they desired to investigate the causes of this dangerous condition of underweight in so many children of Greater Boston. The execution of a program was retarded in the early fall by the influenza epidemic, and, with the signing of the armistice, war committees began to disappear. It was necessary to modify the program and hasten the work to meet new conditions; it became evident, therefore, that it would be unwise to attempt intensive work with five thousand children and

so the committee selected one district, namely, Roxbury, for a careful study of ten per cent. of the underweight group of the entire city. Statisticians agreed that the results shown by such a study would be a fair basis on which to judge the needs of all the underweight children. Roxbury was selected because it has a cosmopolitan population and because there were nearly one thousand children there who obviously needed care, although in any other district of Boston the five hundred underweight children of pre-school age could have been found.

In order to determine, therefore, the type of care needed by each child, two clinics were opened in March, conducted and financed by the Baby Hygiene Association, for the purpose of making the five hundred physical examinations.

One clinic, located in the Roxbury Neighborhood House, 859 Albany street, was conducted each day from 11 o'clock A.M. to 1 o'clock P.M., and the other in the Municipal Building at 1049 Columbus avenue, from 4 to 6 o'clock P.M. The clinics continued forty-three days and the same two doctors, both specialists, were in daily attendance, being assisted by public health nurses. The children were undressed, weighed, measured, and thoroughly examined. The eagerness with which the mothers of the district availed themselves of the opportunity for having their children examined, and the promptness with which most of them followed direc-

tions received at the clinics were most gratifying. If the response to this special piece of work is a fair indication of the attitude of mind of the mothers of Boston, it is safe to say that they are ready for the biggest educational program that the city can offer. The response and appreciation shown by the parents were most gratifying. All sorts of home adjustments were made for the sake of getting the children to the clinics to learn the truth about their physical needs. From the homes on the outer border lines of Roxbury, it was difficult for mothers to travel to the clinics with two or three small children. For these families motor transportation was provided. The Red Cross Motor Corps contributed part of the service, and the remainder was paid for with the money donated to the committee by interested people who realized that speed in executing the program was economy in the end. The service was also used by the nurses in transporting children whose mothers were ill.

Five hundred and fifty examinations were made. Fifty of these children were found to be without physical defects. Their weight was average for their height, according to our present day standards, and there was no reason for retaining them in the study group.

In all the following tabulations, the table used for comparison was the "Age, Height, and Weight Table" issued by the Children's Bureau for use during the National Weighing and Measuring Campaign last year.

TABLE I.

DISTRIBUTION BY HEIGHT ACCORDING TO AGE OF CHILDREN OF ROXBURY EXAMINED DURING STUDY OF BOSTON CHILD-WELFARE COMMITTEE.

Age	Number of children examined				Number whose height was below average												Number whose height was above average												Number of children whose height is average.	
	Total		Total		Total		Total		Total		Total		Total		Total		Total		Total		Total		Total		Total		Total			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls		
Total	500																													
2 months & under	5	3	4	1	2	1	2	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	
4 to 6 inclusive	6	5	2	2	2	2	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	4	3		
7 to 12 "	16	15	8	9	1	6	5	4	2	0	1	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	12	6		
13 to 18 "	36	33	29	21	8	13	51	7	7	1	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	19	7		
19 to 24 "	27	23	17	9	6	3	9	5	2	1	4	2	2	2	2	0	2	0	2	0	0	0	0	0	0	0	18	6		
25 to 30 "	19	23	12	15	2	6	7	6	3	0	3	0	3	0	3	0	3	0	0	0	0	0	0	0	0	0	13	9		
31 to 36 "	17	19	9	13	3	6	4	6	1	5	3	4	3	1	1	1	0	2	1	0	0	0	0	0	0	0	11	4		
37 to 42 "	17	19	9	13	3	6	4	6	3	0	4	3	3	1	1	1	0	2	1	0	0	0	0	0	0	0	17	6		
43 to 48 "	33	16	19	7	10	2	6	6	3	0	4	3	3	1	1	1	0	2	0	0	0	0	0	0	0	0	19	11		
49 to 54 "	16	21	6	16	3	9	3	6	2	1	6	2	6	0	0	2	0	2	0	0	0	0	0	0	0	0	8	4		
55 to 60 "	13	19	13	14	9	9	1	2	3	3	6	6	3	8	2	0	1	0	1	0	0	0	0	0	0	0	4	4		
61 to 66 "	16	12	6	6	6	3	0	2	0	1	4	4	4	4	0	0	0	0	0	0	0	0	0	0	0	0	7	5		
67 to 72 "	14	12	6	10	4	4	1	6	0	1	3	1	3	1	0	0	0	0	0	0	0	0	0	0	0	0	17	6		
Total	252	148	145	140	69	72	67	64	19	14	36	28	27	21	6	7	3	0	161	71	60									

By this table it is shown that there are 285 children whose height is below average for their age. The number whose height was above average was 64 and the number of children whose height was average for their age was 151. In other words, there are 285 children out of 500 who are too short for their age.



TABLE II.

DISTRIBUTION BY WEIGHT ACCORDING TO AGE OF CHILDREN OF ROXBURY EXAMINED DURING STUDY OF BOSTON CHILD WELFARE COMMITTEE.

Age	Number of children examined				Number whose weight was below average								Number whose weight was above average								Number of children whose weight is average				
					Boys				Girls				Boys				Girls								
	Total	Boys	Girls	Total	Total	Boys	Girls	Total	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls					
Total	500				252	248	200	204	30	35	68	63	112	106	23	14	16	6	4	6	3	3	69	29	30
3 months & under		5	3	5	2	1	0	1	2	1	0	1	0	1	0	0	0	0	0	0	0	2	1	1	
4 to 6 inclusive		6	5	4	4	2	2	1	2	1	0	0	0	0	0	0	0	0	0	0	2	2	1	1	
7 to 12 "		15	15	9	13	3	5	2	5	4	3	2	0	1	0	1	0	0	0	0	6	4	2		
13 to 18 "		38	33	30	19	4	4	11	12	15	3	3	1	2	0	1	1	0	0	18	6	13			
19 to 24 "		27	23	21	17	1	3	8	9	12	6	1	2	0	0	3	2	1	0	9	6	4			
25 to 30 "		23	24	22	16	2	2	8	7	12	9	1	3	0	2	0	0	0	1	3	0	3			
31 to 35 "		19	23	15	21	2	6	3	4	10	11	0	2	0	1	0	0	0	1	4	4	0			
36 to 42 "		17	29	13	27	2	6	5	7	6	14	3	0	3	0	0	0	3	0	3	1	2			
43 to 49 "		33	10	26	14	4	3	9	6	13	6	3	3	3	1	0	1	0	1	6	4	1			
50 to 54 "		10	22	12	20	3	2	1	2	6	16	5	1	3	0	1	1	1	0	2	1	1			
55 to 60 "		13	19	21	19	0	2	4	1	17	16	2	0	1	0	1	0	0	0	0	0	0			
61 to 66 "		16	12	16	9	3	0	3	4	9	8	0	2	0	2	0	0	0	0	1	0	1			
67 to 72 "		14	22	9	21	3	0	2	3	4	18	2	0	2	0	0	0	0	0	4	3	1			
		252	248	200	204	30	35	68	63	112	106	23	14	16	6	4	6	3	3	69	29	30			

By this table it is shown that there are 494 children whose weight is below average, 37 whose weight is above average, and 69 whose weight is average for their age. In other words, there are 404 children whose weight is below average for their age. Another significant fact is that 218 children are from 5 to 6 pounds below average for their age, and of these the largest number is found between the ages of 13 and 60 months.

TABLE III a.

DISTRIBUTION OF PER CENT. UNDERWEIGHT ACCORDING TO HEIGHT OF CHILDREN OF ROXBURY EXAMINED DURING STUDY OF BOSTON CHILD WELFARE COMMITTEE.

Number of children examined ..... 500  
 Number of children whose weight is average according to height ..... 51

PER CENT. UNDERWEIGHT	No. in Each Per Cent. Group as Specified		
	Total	Boys	Girls
2%	5	3	2
3%	25	17	8
4%	40	24	16
5%	15	7	8
6%	20	8	12
7%	22	14	8
8%	22	10	12
9%	24	9	15
10%	31	13	18
11%	14	5	9
12%	37	12	25
13%	17	8	9
14%	32	15	17
15%	16	7	9
16%	24	12	12
17%	11	9	2
18%	18	9	9
19%	1	1	3
20%	14	8	6
21%	2	1	1
22%	6	4	2
23%	2	1	1
24%	4	3	1
25%	0	0	0
26%	0	0	0
27%	0	0	0
28%	0	0	0
29%	1	1	0
30%	1	0	1
33%	1	0	1
38%	1	1	0
48%	1	1	0
	416	203	213

There are 311 children 7 per cent. or more underweight shown in the table above. "Clinical experience has led us to the conclusion that a child 7 per cent. or more underweight might be considered an ill child."

\* Malnutrition and Health Education. David Mitchell, Bureau Educational Experiments, New York.

TABLE III b.

DISTRIBUTION OF PER CENT. OVERWEIGHT ACCORDING TO HEIGHT OF CHILDREN OF ROXBURY EXAMINED DURING STUDY OF BOSTON CHILD WELFARE COMMITTEE.

Number of children examined ..... 500  
 Number of children whose weight is average according to height ..... 51

PER CENT. OVERWEIGHT	No. in Each Per Cent. Group as Specified		
	Total	Boys	Girls
2%	3	1	2
3%	2	1	1
4%	9	4	5
5%	3	1	2
6%	2	1	1
7%	1	0	1
8%	0	0	0
9%	2	0	2
10%	3	3	0
14%	2	2	0
15%	2	2	0
16%	3	3	0
19%	1	0	1
	33	18	15

By this table it is shown that only 33 children of the 500 examined are overweight, and that there are 51 of the entire number whose weight is average for their height.

TABLE IV.

DISTRIBUTION OF DEFECTS.

Number of children examined ..... 500  
 Number of children having no defects .. 100

No. of Defects	Children Having Defects as Specified		
	Total	Boys	Girls
1 defect	109	63	46
2 defects	175	75	100
3 "	70	33	37
4 "	36	23	13
5 "	5	3	2
6 "	4	3	1
7 "	1	0	1
	400	200	200

NOTE: Most parents believed their children to be perfectly well when they brought them to the clinic. Fifty-two boys and 48 girls who were underweight are free from physical defects, and 81 children with physical defects are not underweight.

## PHYSICAL DEFECTS FOUND IN EIGHTY-FOUR CHILDREN NOT UNDERWEIGHT.

CASES		CASES	
Abscess of ear	2	Mumps	1
Adenoids	9	Nasal obstruction	3
Adenitis	2	Naevus	1
Ant. fontanelle open	3	Otitis media	4
Ant. fontanelle closed	1	Prepuce, adherent	1
Bronchitis	1	Phimosis	4
Carious teeth	8	Pediculosis	10
Coryza	16	Paresis	1
Eczema	5	Rickets, active	44
Epiphysis	3	Rickets, old	9
Endocarditis	3	Rhinitis, chronic	1
Empyema, old	1	Syphilis, congenital	1
Flat-foot	1	Tonsils, enlarged	7
Hernia, umbilical	3		
Hernia, abdominal	1		
Ichthyosis	1	TOTAL	147

TABLE V.

DISTRIBUTION OF DEFECTS ACCORDING TO AGE OF CHILDREN OF ROXBURY EXAMINED DURING STUDY OF BOSTON CHILD WELFARE COMMITTEE.

Defects	Total number of defects as specified		Total number of children examined 627											
			Infants as specified according to Age											
	Boys	Girls	Total	1 yr & under	Total	1 year & 2 yrs	Total	2 yrs & 3 yrs	Total	3 yrs & 4 yrs	Total	4 yrs & 5 yrs	Total	5 yrs & over
1 Abscess of Ear	1.4	7	3	4	2	2	1	2	1	1	1	3	3	3
2 Adenoids	9.9	44	24	27	3	2	1	7	3	4	9	2	7	17
3 Adenitis	2.0	14	7	7	2	1	1	4	3	1	6	1	4	3
4 Adenitis, Cervical (1)														
5 Adenitis, General (2)														
6 Adenitis, Para-bronchial														
7 Adenitis, T. B. (2)														
8 Anemia	.8	4	2	2	1	1	1	1	1	1	1	1	2	1
9 Rheumatism	.4	2	1	1										
10 Bronchitis	1.0	10	6	4	2	1	1	3	3				6	2
11 Conjunctivitis	.2	1	1	0									1	1
12 Constipation	.4	2	1	1									1	1
13 Coryza	15.2	66	20	36	11	6	6	1	1	12	15	4	11	17
14 Debility	.4	2	1	1									2	1
15 Deformity of Foot	.4	2	1	1									2	1
16 Eczema	2.6	13	10	3	4	2	6	5	1	2	3	1	2	1
17 Endocarditis	3.4	17	11	6	1	1	1	1	1	1	1	1	14	9
18 Elongated Coccyx	.2	1	1	1										
19 Epilepsy	.2	1	1	1										
20 Peptic Ulcer	.4	2	1	1										
21 Flat Foot	1.1	6	1	4									1	2
22 Scrofula	.2	1	1	1	1	1	1	1	1	1	1	1	3	1
23 Heart, Congenital	1.6	6	1	5									1	4
24 Hernia, Umbilical	1.6	6	3	3									1	1
25 Hypo Spadias	.4	3	3	0									1	1
26 Ichthyosis	.6	3	3	0									3	3
27 Idiocy, Microcephaly	.6	3	3	0									3	1
28 Infected Finger	.2	1	1	0									1	1
29 Impetigo Contagiosa	.6	3	2	1									2	2
30 Intestinal Indigestion	1.6	4	4	2	1	1	2	1	1	1	1	1	2	1
31 Malaria	.2	1	1	0									1	1
32 Mumps	.2	1	1	0									1	1
33 Naevus	.2	1	1	0									1	1
34 Nasal Obstruction	2.6	28	17	11	1	1	2	2	3	7	4	3	16	9
35 Old Empyema	.4	2	1	1									2	1
36 Otitis Media	4.4	13	6	5	5	2	1	4	3	1	1	1	3	2
37 Parotitis	.2	1	1	0									1	1
38 Pediculosis	17.7	85	30	47	1	1	9	9	14	6	6	6	61	53
39 Pharyngitis	1.4	7	1	5	1	1	3	3	2	1	1	1	1	1
40 Phimosis	.2	1	1	0									1	1
41 Pin Worms	1.4	7	1	5	2	2	6	6	2	2	2	2	6	3
42 Prepuce, Adherent	1.6	8	0	0	1	1	4	4	1				3	3
43 Rhinitis, Chronic	.6	3	3	0									3	3
44 Rickets, Active	36.6	198	90	120	24	5	9	62	47	36	17	16	56	11
45 Rickets, Old	9.7	45	33	12									24	41
46 Scabies	.2	1	1	0									1	1
47 Short Leg	.2	1	1	0	1	1	1						1	1
48 Shoulder, Displaced	.2	1	1	0									1	1
49 Shoulder, Round	.4	2	1	1									2	1
50 Strabismus	1.2	6	4	2									4	2
51 Syphilis, Congenital	.2	1	1	0	1	1							2	2
52 Teeth, Carious	19.4	97	42	55									40	38
53 Tumor	.4	2	1	1									2	2
54 Tonsils, Enlarged	15.7	75	31	44	2	2	10	6	6	18	4	14	45	20
55 Tonsitis	.2	1	1	0									1	1
56 Tumor, Abdominal	.2	1	1	0									1	1
	82.9	424	400	65	40	40	198	122	74	141	42	79	423	223

By this table it is shown that 13.2% of the children were suffering from coryza, that 17% had pediculosis, that 19.1% had carious teeth, that 15% had enlarged tonsils, and that 38.6% had active rickets, the greatest number of which were between the ages of one and two years.

TABLE VI.

DEFECTS FOUND IN CHILDREN UNDER ONE YEAR OF AGE	ADDITIONAL DEFECTS FOUND IN CHILDREN BETWEEN ONE AND TWO YEARS	ADDITIONAL DEFECTS FOUND IN CHILDREN BETWEEN TWO AND THREE YEARS	ADDITIONAL DEFECTS FOUND IN CHILDREN BETWEEN THREE AND FIVE YEARS
Adenoids			
Tonsils			
Coryza			
Rickets			
Endocarditis, Chronic			
Bronchitis			
Adenitis			
Phimosis			
Eczema			
Prepuce, adherent			
Otitis Media			
Naevus			
Intestinal Indigestion			
Congenital Syphilis			
Paresis			
Abscess of Ear			
Nasal Obstruction			
Anemia			
German Measles			
Pharyngitis			
Short Leg			
Pediculosis			
	Feeble Mind		
	Idiocy		
	Epilepsy		
	Pin Worms		
	Hypospadias		
	Hernia		
	Enlarged Epiphysis		
	Constipation		
	Strabismus		
	Thrush		
	Carious Teeth		
	Old Rickets		
	Congenital Heart		
	Malaria		
	Flat Foot		
	Abdominal Tumor		
	Tonsillitis		
	Elongated Coccyx		
	Chronic Rhinitis		
	Mumps		
	Impetigo		
	Suppurating Teeth		
		Debility	
		Round Shoulders	
		Infected Finger	
		Scabies	
		Blepharitis	
		Conjunctivitis	
		Deformity of Foot	
		Old Empyema	
		Right Shoulder Displaced	
		Ichthyosis	

In this table are shown the defects which occurred at different years, and demonstrates the need of health supervision until the child comes under the care of the school physician.

LIST OF NATIONALITIES OF CHILDREN UNDERWEIGHT  
ACCORDING TO HEIGHT.

American	181*	Denmark	2
Irish	85	Portuguese	5
Italian	20	Newfoundland	6
Scotch	7	Russian Lithuanian	2
Russian	33	Armenia	2
Canadian	9	West Indies	7
Nova Scotia	6	Sweden	2
Poland, Russian	7	New Brunswick	2
P. E. Island	1	Poland	1
Austrian	7	Jamaica	2
English	15	Unknown	9
Norwegian	1		
German	3	TOTAL	416
Finnish	1		

\* Twenty-six of whom are colored.

## HOME VISITS.

One week before the clinics opened, four public health nurses began to visit the homes of the Roxbury children for the purpose of making the explanations necessary to get the children to the clinics, to book definite dates for their examination, and also to get and record facts about the homes which would be helpful in judging of the conditions under which these children live. It was difficult visiting to do and it required skill to get most of the necessary facts in one visit. This information could not be verified, but was, on the whole, pretty freely given.

An effort has been made to grade the homes on the basis of the following factors: Nationality, occupation, number in family, number of rooms, amount of income and rent. A budget worked out at Columbia University, and published in January, 1919, was used as the basis of comparison in making the classification with results as follows:

A	Homes above border line with large margin of income	22
B	Homes above border line with small margin of income	40
C	Homes on border line	129
D	Homes below border line	118
X	Homes which could not be classified	94
TOTAL		403

The term "border line" is used in reference to the homes where the visits showed that the families were not suffering for the necessities of life, but were getting what they needed. The homes were comfortable and the children were reasonably well dressed.

The number of underweight children found in each classified group are as follows:

A	20
B	38
C	136
D	133
X	89

## HOME CARE.

A glimpse of the home care in this group is afforded by the table below:

CLASS	No. of Homes	MOTHERS WORK OUT OF HOME	AVG. BED-TIME HOUR, P.M.	DAILY REST PERIOD FOR CHILDREN 3-5 YEARS	PLAY IN STREET	PLAY IN YARD	PLAY IN PLAY-GROUND	No. of Homes WHERE CHILDREN ARE NOT TAKEN TO PLAY
A	22	0	7-8	12	7	11	0	4
B	40	0	7-8	24	19	14	0	7
C	129	3	7-8	28	61	49	5	14
D	118	10	8-9	31	66	18	12	2
X	94	24	7-8	19	29	37	12	26
Total	403	37		111	182	159	9	53

Under "Home Care" note that 182 children play in the street because they have no other place to play, and only nine play in a playground, which brings to mind again the fact that a greater number of small playgrounds are needed, that only 114 of the children between the ages of three and six have a daily rest period.

"These under-nourished children are unable to store up in one rest period sufficient energy or vitality to carry them through the day."\*

## FOLLOW-UP WORK.

In accordance with the Committee's policy of not creating new machinery where an agency was already in existence, the children from the Roxbury clinics were referred to the following agencies in Boston:

The Baby Hygiene Association	281†
The Children's Hospital	35
Forsyth Dental Infirmary	56
Boston Dispensary	53
Private doctors	70
City Hospital	4
Homeopathic Hospital	1
TOTAL	500

†100 between 3 and 5 years of age.

Once a month each agency is to report to the Child Welfare Committee the exact condition of each child to which it has rendered service, and if the child is transferred to another agency, that fact also will be reported. By means of this system, the Child Welfare Committee aims to keep a record of each child and to follow the entire group until such time as the children's condition warrants discontinuance.

## COMMUNITY COUNCIL.

The close of the war put an end to the hope of forming in Roxbury a Child Welfare Community Council, to which the results of the above study could be referred. Such a group could not only help the mothers to secure for themselves and children medical or other help, but would be available to carry forward educational work and build up a system of supervision for the children of the district. Such a Council could be a real force for giving the children of that community the best possible start in life. But the money at the disposal of the Child Welfare Committee was not sufficient

\* Malnutrition and Health Education, David Mitchell, Bureau of Educational Experiments, New York.

to perfect a Community Council. The Committee hopes, however, that the facts brought out in this study will strengthen the desire for such a Council, existing among some of the child-welfare organizations in Boston. Many families in Grade D need only such friendly advice and intelligent direction as an interested local body could give.

The Committee feels that the evidence furnished by the study of pre-school children of Roxbury gives sufficient indication that the need of health supervision for children under six years of age is very great. As Roxbury is an average community, it is safe to say that their physical condition is a fair index of the health of children of the same age in Greater Boston and elsewhere.

The Committee wishes to extend thanks for the valuable assistance given by the Baby Hygiene Association, the Roxbury Neighborhood House and the Red Cross Motor Corps.

They also wish to express their indebtedness to the doctors and nurses for their enthusiasm and interest, which have been of the greatest assistance in the work of the Committee.

Respectfully submitted.

HARRIOTT P. CHURCHILL.

(Mrs. Donald Churchill.)

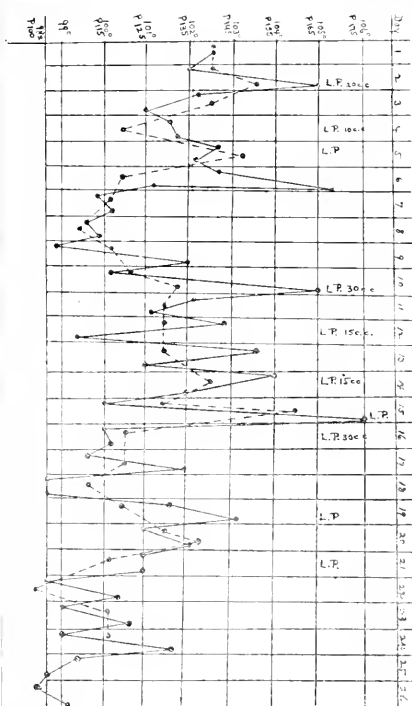
## Clinical Department.

### CASE OF PNEUMOCOCCUS MENINGITIS, WITH RECOVERY.

By A. G. GOULD, M.D., AKRON, OHIO.

IN view of the high mortality incident to pneumococcus meningitis, a case with recovery is worthy of note. The duration of the disease was about four weeks, with variations in temperature from normal to  $106^{\circ}$ , as seen by accompanying chart. Therapy consisted of lumbar puncture with substitution of warm normal saline solution for the spinal fluid withdrawn, digitalis, sodium salicylate and bicarbonate, ice cap, and sponge baths for pyrexia.

Following each lumbar puncture there was a drop in temperature and pulse and general improvement in condition, most noticeable in the relief of the severe headache. The temperature could be used as a reliable indicator of the need for lumbar puncture.



Course, March 18, 1919, to April 16, 1919.  
Solid line—temperature course.  
Broken line—pulse record.  
L. P.—lumbar puncture.

### CASE.

March 18, 1919. Patient, E. C., boy, aged 3 years. Past health had been good. Both parents well and in good physical condition. For several days patient had a "cold" and a cough, with fever. Today, he vomited and was delirious. T.  $102.5^{\circ}$ , P. 140, R. 30. Marked prostration and slight cyanosis of lips. Signs of broncho-pneumonia over the right upper front.

March 19, A.M., T.  $102^{\circ}$ , P. 140, R. 30. During the afternoon the parents noted some tremor and a slight convulsion of arms and legs consisting chiefly of child becoming very rigid and throwing his arms over his head. 5 P.M., T.  $105^{\circ}$ , P. 152, R. 50. Positive neck sign and Kernig more marked on left than on right. Some internal strabismus of left eye. Both eyeballs at times were drawn upward until iris no longer could be seen. Patient was removed to Children's Hospital and lumbar puncture was per-

formed. A cloudy fluid under considerable pressure was obtained. Bacteriologically, pneumococci in great numbers and a few staphylococci were found. Prior to obtaining the bacteriologist's report, 20 c.c. of antimeningococcus serum was given intraspinally. March 20, signs of pneumonia clearing up. March 21, 3 m. antipneumococcus vaccine subcutaneously. March 22, erics out frequently and is very restless. Spinal fluid is today a pure culture of pneumococci; 5 m. antipneumococcus vaccine subcutaneously. March 23, more rational. March 27, T. 105°, P. 132, R. 30. Neck very rigid. Slight left Kernig. March 28, meningeal signs absent. March 29, restless and talking in delirium all night; 4 A.M., T. 104.2°, P. 140, R. 36; slight convulsion lasting a few seconds. March 30, noisy and nervous when awake. April 1, A.M., T. 100°; 7 P.M., T. 106.2°, P. 160, R. 28; neck rigid. Lumbar puncture fluid under much pressure. 8 P.M., T. 104.2°, P. 120, R. 22. April 13, removed to home. July 11, returned from a visit to grandparents in Alabama, in fine condition.

### CONSERVATIVE TREATMENT OF LARGE ADHERENT OVARIAN CYST.

By E. B. FITZ-GERALD, M.D., BOSTON,  
Senior House Officer, Carney Hospital.

[From the Gynecological Service, Carney Hospital.]

EVERY now and again an abdominal cyst is observed, usually of large size and ovarian in origin, which, through obstruction to its blood supply or its distribution or through infection, becomes universally adherent to the abdominal peritoneum and abdominal contents.

To shell this tumor off from the abdominal peritoneum and separate it from the many and often firm adhesions to abdominal viscera means an amount of shock which is usually fatal, the patient dying on the table or a few hours after the operation. Should the shock be weathered a violent septic peritonitis follows, caused by the foul contents of the tumor which it is impossible wholly to keep out of the abdominal cavity while enucleation is being done.

CASE No. 3398. Admitted May 23, 1919. Laundress; aged 54 years. Menstruation began at 15; was always normal and ceased in 1915. No vaginal discharge. For nine months off and on had been treated for "intestinal indigestion." Occasionally of late has had col-

icky pains in the abdomen, especially noticeable during defecation. General health excellent.

Palpation revealed a large very firm tumor extending up above the umbilicus. Through the vagina a hard irregular mass filling the upper part of the pelvis could be felt. No fluctuation was detected. The diagnosis rested between a fibroid and ovarian cyst. Three days after entrance the abdomen was opened.

When through a small incision in the peritoneum the tumor was found to be cystic and adherent, the incision was enlarged to admit the hand. A chocolate colored fluid, to the amount of 2,000 c.c., consisting of detritus and pus, was siphoned and sponged out of the cyst. Many daughter cysts were broken up. Four gauze handkerchiefs were packed into the cyst cavity and the incision closed around them. The pathologist found no evidence of malignant disease.

In three days the drainage was removed, cavity washed out with normal salt solution, followed immediately with Dakin's solution, a small portion of which was left in and the incision kept open with a gauze wick. After ten days with this treatment, during which time the cyst cavity had shrunk and the irrigating fluid was returning clear, there was a slight chill, the temperature rose to 102° F., pulse to 122, and respirations to 26. To insure free drainage a rubber tube the size of the thumb was inserted into the cyst cavity. In three days the temperature and pulse were normal and the discharge very purulent.

To "cut" the pus and facilitate drainage a 1% NaCl and a 2.5% NaCit. solution were used.

Twenty-seven days after the operation the cyst cavity held 125 c.c. This cavity slowly shrunk down to a sinus which was closed by packing with bismuth paste. The patient was in the hospital six weeks and reported as an out-patient three times a week for six weeks.

### Medical Progress.

#### RECENT PROGRESS IN NEUROLOGY.

By ISADOR H. CORIAT, M.D., BOSTON.

FEEDING IN MYASTHENIA GRAVIS.

G. H. Monrad-Krohn.

THE authors' abstract, taken from an article in one of the Scandinavian medical journals

and published in the *Journal of Nervous and Mental Diseases* (August, 1919), discusses many practical points in the treatment of this serious disease, particularly concerning the nutrition of the patient.

He points out that the result of the electrical examination (myasthenic reaction) should be given its practical application in the treatment and particularly in the feeding of the patient. During the feeding a nurse should always be present and see that when the patient has swallowed one mouthful of food, a sufficient interval (2 to 4 minutes according to the gravity of the case) is allowed to pass before the next mouthful is given. This period of rest between each mouthful gives the muscles concerned in chewing and swallowing an opportunity to recover their strength after each effort. As long as the food is not so hard that mastication becomes an effort, it does not matter whether the food be solid or liquid. The patient should always be spoon fed. It is unwise to allow a myasthenia gravis patient to drink out of a cup or a glass, as this produces a series of deglutition reflexes following close upon one another. This may produce abnormal fatigue with choking and consequent bronchopneumonia. In the attacks of dyspnoea, the best treatment is prolonged artificial respiration. This does not seem to interfere with the recuperation of the abnormally tired muscles. Electrical stimulation of the phrenic nerve is absolutely contraindicated, as this may produce a myasthenic fatigue of the diaphragm. Tube feeding is prohibited. If the feeding by mouth does not provide sufficient nutrition, rectal feeding should be used.

(This theory of intervals of rest in the feeding of a myasthenic patient is perfectly sound. Both in voluntary activity and by electrical stimulation, the muscles in the disease fatigue very quickly, but after a rest of a minute or two, they can again be voluntarily contracted or will respond to the faradic current. In our experience in the treatment of myasthenia gravis, we have not only insisted on liquid food and soft solids, but at the same time have reinforced the rest of the affected muscles by prohibiting talking as much as possible and requesting that communications be carried on by writing instead of by speech. Since in the severe cases, starchy foods are not well digested, because of insufficient mastication and mixture with saliva, produced by the rapid fatigue of the muscles, the patient either may keep starches

in the mouth as long as possible to mix them with saliva, or in the place of that an artificial diastatic ferment, such as taka-diastase, might be found useful.

The same rules concerning feeding should be applied to the closely related disease of progressive bulbar paralysis.—I. H. C.)

#### CORPUS LUTEUM IN NEUROLOGICAL PRACTICE.

H. Climenko, *Endocrinology*, Vol. III, No. 1, 1919.

In this paper only the so-called "nervous syndrome" associated with disturbed sexual gland activity is considered. Nine cases in all were studied. The first and fourth cases were those of a so-called "menstruation insanity" as described by Krafft-Ebing and where the corpus luteum extract seemed to have curative effect. The second case was one of hysteria with mechanical obstruction in the uterus. In this instance the effect of the administration of corpus luteum was very questionable. In the third case, termed "a mild type of manic-depressive insanity," the patient began to improve soon after the administration of the glandular extract. The sixth and seventh cases were polyglandular disorders, in which the cessation of menstruation was merely an accompanying symptom. The other cases suffered from vague neurotic disturbances at the menstrual period, and these cases were most promptly benefited by the corpus luteum extract. As a control, the administration of the drug to male neuroasthenics, multiple sclerosis and in the early stages of dementia praecox, was without effect; neither did it affect the blood pressure in the arterio-sclerosis of male and female patients. It was found that two grains was as large a dose as it was necessary to use. Hypodermic preparations did not give as good results as the drug given by the mouth.

Climenko concludes that the corpus luteum acts best when there is reason to believe that the native corpus luteum is still present, but when menstruation is discontinued by virtue of disturbances in other ductless glands, corpus luteum will not produce menstruation.

#### THE MECHANISTIC CLASSIFICATION OF NEUROSES AND PSYCHOSES.

Edward J. Kempf, *Journal of Nervous and Mental Disease*, Vol. I, No. 2, Aug., 1919.

The system of classification proposed is based essentially on the integrative functions of the nervous system and maintains that the same

forces which build up a personality when harmoniously integrated, cause its deterioration when unadjustable conflicts occur. According to this classification, the neuroses have been differentiated with five distinct types, as follows:—

1. Suppression neuroses, characterized by the individual being clearly too vaguely conscious of the nature and effect upon himself of his ungratified cravings (example—anxiety neurosis).

2. Repression neuroses, in which the individual attempts to prevent the automatic cravings from causing him to be conscious of their nature or needs and influencing his personality (example—compulsion and fear neuroses).

3. Compensatory neuroses, when the individual feels that he has cravings that are socially inferior and detrimental and initiates a compensatory reaction which is disguised as a protective or comforting mechanism (example—paranoid types.)

These three types as a group are designated as benign neuroses. The second group, that of pernicious neuroses, is divided into

4. Regression neuroses, in which the individual gives up or yields to the struggle and regresses to a preadolescent or infantile functional level (example—allied dementia praecox types).

5. The dissociation neuroses, which comprise those cases where repression reaches the point of dissociation and finally dominates the personality (example—hysteria).

of mental torticollis presented still greater difficulties not only because of the resistance, but because the roots of the neurosis were so deeply seated. In dementia praecox, the chief difficulty of analysis lay in the inaccessibility of the patient's conscious and unconscious mental life, since many of these cases presented themselves for treatment at a time when the mental deterioration was too far advanced.

(My own experience has been that the periodic depressions should be psychoanalyzed not during the period of depression but during the period of remission, in an attempt to eliminate the factors which might precipitate a future attack. In mental torticollis, the effects of psychoanalysis in clearing up the muscular spasm have been gratifying, particularly in those cases where the usual orthopedic and re-educational methods had failed. In dementia praecox, as has been shown in my paper already referred to in "Progress" only the early or mild cases can be benefited by psychoanalysis. In a previous paper on the psychoanalytic treatment of retarded depression (*American Journal of Insanity*, Jan., 1919), Clark makes a plea for an intensive psychoanalysis in cases of retarded depressions. As a result of his experience, he is convinced that such individuals will make a sounder recovery from a specific attack, and recurrences in after life can often be avoided.—I. H. C.)

#### EXPERIMENTAL HYDROCEPHALUS.

Walter E. Dandy, *Annals of Surgery*, Vol. LXX, No. 92, Aug., 1919.

After a brief description and history of the mechanical factors which enter into the etiology of hydrocephalus, Dandy attempts to solve the problem by the production of all types of hydrocephalus through the precise experimental methods. The experiments were conducted on dogs, and the following conclusions were drawn:

Hydrocephalus has been produced by placing an obstruction in the aqueduct of Sylvius and dilation of the third and both lateral ventricles results. The occlusion of one foramen of Monroe is followed by a unilateral hydrocephalus. If the choroid plexus of one lateral ventricle is completely removed at the time the foramen of Monroe is occluded, not only does no dilation occur, but the entire lateral ventricle collapses. This is the only absolute proof that the cerebro-

#### PSYCHOANALYTIC TREATMENT OF BORDERLAND NEUROSES AND PSYCHOSES.

L. Pierce Clark, *The Psychoanalytic Review*, Vol. vi, No. 3, July, 1919.

This short paper consists of practical remarks in the utilization of the psychoanalytic method in the treatment of borderland neuroses and psychoses. The types of cases studied are manic-depressive insanity (periodic depressions), mental torticollis and dementia praecox.

In the periodic depressions it is necessary to enquire carefully into the conscious and fore-conscious settings of the patient's difficulties, particularly those difficulties which seem to act as precipitating or upsetting causes in the periodic depressions. These cases are more difficult of analysis than the hysterical neuroses, but the analysis furnishes material for advice concerning readjustment and reformulation of the attitude towards various life problems. The cases



spinal fluid is formed from the choroid plexus and at the same time it proves that the ependyma does not secrete cerebrospinal fluid.

If the choroid plexus of both lateral ventricles is removed and an obstruction is placed in the aqueduct of Sylvius, hydrocephalus still results in the third and both lateral ventricles, but at a reduced rate. The fluid forms from the choroid plexus of the third ventricle, but cannot escape into the subarachnoid space. Cerebrospinal fluid flows in all the cerebral ventricles and it is absorbed almost entirely in the subarachnoid space. The sole communication between the ventricular system and the subarachnoid space is through the foramina of Luschka and the median foramen of Magendie. The phenolsuphonephthalein test will prove conclusively whether the foramina of Luschka and Magendie are opened or closed. Closure of these foramina invariably produces hydrocephalus.

Hydrocephalus follows ligation of the vena magna Galeni if the ligature is placed at the origin of this vein, because of an over-production of cerebrospinal fluid. In other types of hydrocephalus both obstructive and communicating, the accumulation of fluid is due to a diminished absorption of cerebrospinal fluid.

#### NON-PARETIC NEUROSYPHILITICS. TREATED BY INTRAVENTRICULAR INJECTIONS OF SALVARSANIZED SERUM.

A. L. Skoog and Karl A. Menninger, *Journal of Nervous and Mental Disease*, Vol. 1, No. 2, August, 1919.

This paper deals with a selected group of patients treated for neurosyphilis by the intraventricular method. The cases were minutely studied over a period of three months. Both the acute and chronic forms were represented and all the cases were well advanced, in fact some of the patients faced an extremely bad prognosis. After a discussion of the serological and surgical technique, followed by an outline of the cases in the series treated, the following conclusions are given:

1. Twelve cases of non-paretic neurosyphilis were treated intensively by intracerebral injection of salvarsanized serum.

2. Serum salvarsanized *in vivo* was extensively used. Local anesthesia is utilized for trephining; and the parietal area is selected.

3. The reactions to treatment were, as a rule, not severe, but occasionally became quite alarm-

ing and even fatal. The symptoms consist usually in slight febrile reaction, more or less headache, and variously located pains sometimes accompanied by a toxic meningitis of short duration.

4. The 12 cases presented embrace 4 cases diagnosed vascular types of cerebral syphilis, 2 tabes dorsalis, 1 idiot, and 5 cases of unclassified neurosyphilis, 2 of which may be tabo-paresis.

5. The clinical results of treatment showed marked improvement in 2 cases, slight improvement in 6, none at all in 2, and fatality in 2 cases. The improvement showed no tendency to follow diagnostic classes.

6. The laboratory returns showed as a result of the treatments:

- (a) Wassermann changed in blood serum in 50 per cent. cases; spinal fluid in 50 per cent. cases; cerebral fluid in 50 per cent. cases.
- (b) Gold sol in reaction (spinal fluid) diminished in 40 per cent.; intensified in 30 per cent.; (irregular in cerebral fluids).
- (c) Globulin in cell counts of spinal fluid not markedly altered.

7. The laboratory data indicated marked improvement in two cases, slight improvement in 5; none at all in 3.

8. The clinical and laboratory data in point of response to treatment would appear similar numerically; but a study of individual cases shows that they agree precisely in only 20 per cent. of cases; and differ completely in 50 per cent., showing a tendency to be reciprocal.

9. It is apparent from the differences in the spinal and cerebral fluids that at least in certain pathological conditions, such as those presented, there is an interference in the communication channels between the ventricles and the fluid spaces of the spinal chord.

10. Two cases died: one probably as a direct result of the treatment, the other possibly as an indirect result.

11. On the whole, the brief but intensive treatment appears to have given encouraging results, which possibly would have been much more gratifying had it been longer continued. The improvements were moderate rather than extreme (but no cases were made worse save the two who succumbed), either from the laboratory or clinical standpoint. Two cases with rather remarkable improvement are included. One

gratifying feature is the enthusiasm with which most of the patients cooperate in and appreciate the treatments. This is in one way a drawback, as they are apt to consider themselves so much improved that further treatment is unnecessary.

### Book Reviews.

*Studies from the Rockefeller Institute for Medical Research.* Reprints, Volume XXIX. New York: The Rockefeller Institute for Medical Research. 1918.

The investigations carried on at the Rockefeller Institute open to the profession new and promising fields of scientific research. In order to make these studies more readily available, reports which are first published in various journals are collected in volumes designated, *Studies from the Rockefeller Institute for Medical Research.* This volume, Number XXIX, contains articles of unusual interest in pathological and bacteriological subjects, in physiology and pharmacology, chemistry, experimental surgery and biology, and animal pathology.

A report written by Harold L. Amoss, M.D., considers the question of providing federal standardization for preparations of the anti-meningococcic serum which has been used with beneficial results in the treatment of epidemic meningitis. Five samples of this serum which were tested showed the striking inferiority of the commercial to the non-commercial products. Suggestions for standardizing this serum, and advice on the methods of administering it are included in this report.

The problem of the mode of infection in poliomyelitis has been explained in various ways. The general results of chemical observation and experiment, however, have led to the conclusion that the microbe cause is conveyed from one individual to another by personal contact. A report by Edward Taylor, M.D., and Harold L. Amoss gives a detailed description of cases which demonstrate the carriage by healthy persons of the virus of poliomyelitis. Previous experiments made by Wickman, Flexner, Lewis, and others lead to similar conclusions.

The contributions of Jacques Loeb to this volume are of particular value. An investigation conducted by Loeb and John H. Northrop by quantitative experimental methods, tends to prove that the "instinctive" motions of animals to light are phenomena of automatic orientation (heliotropism) and a function of the constant intensity of light—the exact expres-

sion of the function being the Bunsen-Roscoe law of photochemical action.

A report on "The Influence of Food and Temperature upon the Duration of Life," by Loeb and Northrop, considers by quantitative methods the causes which determine the natural duration of life. Experiments with fruit flies show that the temperature coefficient for the duration of life is approximately identical with the temperature coefficients for the duration of the larval and pupal stage within the limits where development is normal. It was discovered that food, as well as temperature, influences the duration of life. An adequate food supply for the growing larva includes yeast, while for the adult fly which no longer grows, "glucose-agar" (with or without yeast) is sufficient. A paper by Northrop presents further data on the growth and duration of life of an organism. His experiments show that if the larval period is prolonged by inadequate feeding the total duration of life can be prolonged. Two other articles contributed by Loeb consider "The Diffusion of Electrolytes through the Membranes of Living Cells," and "Fecundation et Phagocytose."

Another paper, "Observations on Kidney Function in Diabetes Mellitus," by Reginald Fitz, M.D., reports studies on renal function in diabetes under varying conditions of glycosuria, hyperglycemia, and acidosis.

*The Soldier's Heart and the Effort Syndrome.*

By THOMAS LEWIS, M.D., F.R.C.P., F.R.S., D.Sc. New York: Paul B. Hoeber. 1919.

With the advent of the present war and the call to military service of men engaged in all kinds of occupations, the medical officers who treated patients suffering from disturbances of the cardio-vascular system found many conditions frequent in soldiers which in civilian experience were comparatively rare. Realizing the great benefit which the successful application of many remedial measures in military hospitals would be to the civilian population in the years to come, the author has made this collection of war-time notes and presented his important observations to the profession under the following headings: Introductory Remarks; The "Effort Syndrome": Its Symptoms and Signs Contrasted with those of Heart Disease; Etiology of the "Effort Syndrome" and of Heart Disease in Soldiers; The Diagnosis of Heart Disease in Soldiers; Prognosis and Treatment in the "Effort Syndrome"; Some General Considerations; Medical Reports on Discharged Soldiers and on Routine Examination of the Hearts in Recruits, etc. The book is clearly and intelligently written and should take its place with the author's previous works as a valuable contribution to present-day knowledge concerning the capacity and clinical disorders of the heart.

*The Johns Hopkins Hospital Reports.* Volume XVIII, Fasciculus II. Department of Pathology. Baltimore: The Johns Hopkins Press. 1917.

The work of the Department of Pathology of the Johns Hopkins University and Hospital has been collected and published in Volume XVIII of the Johns Hopkins Hospital Reports. All material unpublished up to the time of this report is presented in detail in this volume, and many articles previously published are again reprinted in full instead of in abstract form.

Among the articles of particular interest may be mentioned "The Rôle of the Autopsy in the Medicine of Today," by W. C. Winternitz, who discusses the importance of the systematic performance of autopsies on the progress of physical diagnosis and scientific therapy. He reviews briefly the historical development of pathological anatomy, and points out the value of autopsies to the physician, the hospital, the family, and the community. An article by Stanhope Bayne-Jones on "The Blood Vessels of the Heart Valves" presents positive evidence of vascularity of the valves of the heart, with historical and critical review of the various controverted aspects of this subject. A third contribution of interest is the report of two fatal cases following Percy's low heat treatment of carcinoma of the uterus, by V. N. Leonard and A. B. Dayton. As only one case treated by this method and terminating in death has been reported thus far, it has been considered important that the histories of the two fatal cases reported here should be described.

"Studies of the Metabolism of Cells in Vitro," by M. T. Burrows and C. A. Neymann, indicate that amino-acids show evident toxicity towards growing cells, inhibiting their growth and finally killing the cultures. "The Significance of the Lunula of the Nail," reporting the observations of M. T. Burrows during his study of the structure of the nail and its environment, attempts to explain the conditions which regulate its continuous growth throughout the life of the individual. A report of attempts to cultivate bladder and prostatic tumors outside the body has been presented by M. T. Burrows, J. E. Burns, and Y. Suzuki. This is an important experiment which has not previously been undertaken, and is important in that the facts discovered may prove to be of importance in gaining a better understanding of the conditions essential for the growth of body cells and the general structure of the cells.

In reporting their study of a small outbreak of poliomyelitis in an apartment house, occurring in the course of an epidemic in a large city, M. T. Burrows and E. A. Park point out several features of unusual interest: the disease appeared in all five children of one fam-

ily; a variety of forms of the disease manifested itself; there was an absence of change in the spinal fluid in three of the cases; and the proportion of non-paralytic forms of poliomyelitis was unusually large.

The observations of these investigators are of considerable value. Many of the articles included in this annual volume are illustrated by numerous plates and text figures. The publication of this estimable collection of pathological research material should be greatly appreciated by the profession.

*Abstracts of War Surgery.* Prepared by the Division of Surgery, Surgeon-General's Office. St. Louis: C. V. Mosby Company. 1918.

The Surgeon-General's office, through the Division of General Surgery, has prepared an abstract of the war literature of general surgery that has been published since the declaration of war in 1914. As an emergency war measure one hundred copies of abstracts of the important general surgical papers bearing on war surgery were distributed to various instructors in our Army surgical schools and to war hospitals. This was done in order that much of the excellent work developed by the French, English and Italians might be appropriated by our medical personnel at a time when ready reference material was necessary. But the demand for these abstracts was so great that it was deemed advisable to meet this approval in printed form. As a result we have in this volume, in a condensed form for ready reference, much of the excellent work accomplished by the medical corps of the allied armies. It is a remarkable collection of abstracts from what have been regarded as the best among important articles written on modern war surgery. Many of these papers have been abstracted from the medical and surgical journals at length. The problems of the development of British surgery at the front and in the hospitals on the lines of communication in France have been outlined in the beginning of the book under "General Topics." The fact that these problems and difficulties were met largely by the surgeon himself, because of the lack of knowledge of such injuries as he was called upon to treat, provides much that is interesting in the display of ingenuity in solving these problems. Aside from the strictly scientific viewpoint, this book is an historical record of achievement under most trying conditions. The papers abstracted are arranged under the following headings. Wound Infection and Treatment, Tetanus, Gas Gangrene, Abdominal Injuries, Chest Injuries, Cardiovascular Surgery, Injuries to the Joints, Fractures, Burns, Anesthesia in Warfare Trench-Foot, Foreign Bodies, Peripheral Nerve Injuries, Injuries to the Jaws and Face.

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## PROPOSED MASSACHUSETTS HEALTH EDUCATION LAW.

THE declining birth rate of the white race is becoming a matter of serious import. In France the vital statistics for some years have shown more deaths than births, and even in our own country the excess of births over deaths is at the present time less than it has been and should be. France and England are profiting by the lesson which the war has taught them, and have already embarked on campaigns for restoring the physical fitness of their people. Is it not time for us to appreciate the significance of the fact that the draft showed more than thirty-five per cent. of our youth to be defective? In Massachusetts, forty-seven per cent. were rejected. These men were the school boys of yesterday.

In order to improve the physical condition of the school children of today, the National Physical Education Committee has proposed two

health education laws of far-reaching importance. Their purpose is to assist local organizations in starting good Child Health Programs in their own home towns, and to lay the framework necessary for the organization of a broad and uniform Health Education Program in our public schools. For this end, legislation must provide for a director of health education and physical activities in our Department of Education, local supervisors to assist the director, one or more school nurses in every town, and courses in simple health habits in our normal and public schools.

Unsuccessful attempts have been made previously to pass legislation which would make this health education possible. In order to arouse the State to a recognition of the present need of this legislation, a Health Education Committee is being formed to secure the passage of the following two bills, which are to be introduced this winter:

Bill 1. Proposed Massachusetts Health Education Law:

1. The Department of Education, after consultation with the State Department of Health, shall establish minimum rules and regulations and courses of instruction for the teaching of Health Education in the public schools and the normal schools of the Commonwealth. This shall include instruction in personal and community health, and in physical activities related to healthful living and normal recreation.

2. The Commissioner of Education, with the approval of the Board of Education, shall appoint a director of Health Education, with necessary associates, who shall be qualified to supervise and direct the work of Health Education and physical activity.

3. The director of Health Education shall, under the supervision of the Commissioner of Education, work in close coöperation with the school physicians, public health officers, and civic agencies in promoting child welfare.

4. The School Committees in cities and towns, or group of towns, shall appoint a supervisor of health education, with necessary associates, who shall, under the direction of the School Committee, establish, supervise, and direct systematic courses of instruction in health and physical activity.

5. Each city and town, or group of towns, shall furnish adequate instruction and supervision to provide each pupil with a minimum of 60 minutes of systematic health instruction, physical exercise, and recess play during each school day. The school committee may arrange for the use of the school buildings and grounds after regular school hours as community centers for the promotion of healthy recreation.

6. The State shall provide annually to the State Department of Education a minimum of 3 cents per year per child (6 to 18 years of age) for the promotion, supervision, and inspection of health instruction and directed activity.

#### Bill II. Suggested Draft for School Nurses:

Chapter 502, 1906, Section 1, as amended, is hereby further amended by adding after the words, "school physieian," in the second line, the words "and nurses" and after the words "assign one," in the second line, the words "of each,"—so as to read as follows:—

Section 1. The School Committee of every city and town in the Commonwealth shall appoint one or more school physicians and nurses, and shall assign one of each to each school in its city or town, and shall provide them, etc., etc.

These bills are endorsed by the Commissioner of Education, and the State Department of Health. There is nothing in Bill II that would prevent a group of villages employing one school nurse between them. The Health Education Committee has suggested that in order to help secure the passage of these bills, the following form of resolution be passed by as many interested groups as possible and sent to the State legislators:

*Whereas*, the examinations under the draft law have revealed the fact that more than one-third of the young men examined were physically unfit for military service, and

*Whereas*, statistics of the Life Extension Institute and of the Life Insurance Companies show this to be only one evidence of a physical degeneracy prevalent among men and women of all ages, and

*Whereas*, the strenuous requirements of modern life have an irresistible influence away from natural health giving habits and vitalizing physical activities, and

*Whereas*, these unnatural tendencies can be off-set only by the provision of a specially planned and directed program of physical training and wholesome recreation, for both children and adults, therefore be it

*Resolved*, that we favor the establishment in the Schools of the Commonwealth of Massachusetts of an adequate program of physical education, including instruction in simple health principles and adequate provision for physical activities, and urge our legislators to vote for the appointment of a Director of Health Education in our Department of Education, Local Supervisors of Health Education, and one or more School Nurses for every town or group of towns.

The passage of these bills will make possible the proper physical development of the school children of today, thus safeguarding the health of the Nation's youth of tomorrow.

#### RECENT EPIDEMICS.

DURING the past three years, there have been three great destructive epidemics of disease which have ravaged the world, claiming probably more victims than the great war and causing incalculable loss in money and human progress. The general characteristics of these epidemics, together with the practical hygienic measures adopted to control them, were reviewed by Dr. Simon Flexner in his address at the meeting of the Congress of American Physicians and Surgeons held in Atlantic City last June. Such a summary of our knowledge is valuable in enabling us to form judgments of the merits of the measures employed in the control of disease, and suggests new points of attack which may prove their efficacy in the future.

The three epidemic diseases which have swept over the world of recent years, proving to be particularly destructive in the western hemisphere, are poliomyelitis, streptococcus pneumonia, and influenza. Dr. Flexner has described their common characteristics, and also the differences in their nature and in the modes of spreading which make necessary careful discrimination in adopting methods of control. Since 1907, our attention has been called to the seriousness of poliomyelitis as an epidemic disease by the constant recurrence of the disease every summer and autumn, culminating in an epidemic of severe proportions in the winter of 1916. Today we have reliable data concerning the nature of the inciting organism and its manner of leaving the infected or contaminated body within the secretions of the nasopharynx chiefly, gaining access to other human beings by means of corresponding mucous membranes. Our knowledge of poliomyelitis has increased rapidly since the publication of Wickman's clinical studies in 1907.

Streptococcus pneumonia, on the other hand, presented during the winter of 1917-1918 a type which had previously been quite infrequent. It apparently first appeared in fatal form most frequently in military cantonments

in the United States, prevailing for a time as a secondary pneumonia following measles, and later becoming so severe that primary streptococcus pneumonia began to arise and spread to the civil population. Dr. Flexner points out that in dealing with this infection, the chief difficulty has been not in discovering the inciting microbe, but in differentiating the streptococci responsible for the epidemic disease from streptococci possessing the ordinary pathogenic properties. Observation in various cantonnments has shown *Streptococcus hemolyticus* to be the microbic incitant in almost every case. Dr. Flexner believes it probable that the excessively virulent *Streptococcus hemolyticus* was developed not through the introduction from without of a special kind of micro-organism, but by a process of selection, through successive transfer from one person to another, and by gradual enhancement of its invasive properties.

The case of influenza presents greater difficulties of analysis, since there still exist wide divergencies of belief regarding the nature of the inciting micro-organism and modes of infection. To the casual observer, overlooking the significant incidents that precede wide infection, the apparent swiftness of the onset of the epidemic seems to point to the negation of personal communication. Accurate observation has shown, however, that epidemic influenza follows the common rule of being associated with persons and their migrations. As the early cases are usually not severe, because they are rarely attended by pneumonia, there is frequently confusion in making a diagnosis, and intercourse among the sick and well is unrestricted, thus causing the micro-organism to be disseminated until the entire susceptible element of the population is exposed. Dr. Flexner has remarked that in eastern Russia and Turkestan influenza spreads with the pace of a caravan: in Europe and America with the speed of an express train; and in the future it may be that it will spread with the swiftness of an airship. The rate of transmission of the disease is determined in part by the nature of the transportation facilities, and in part also by the accessibility of various regions. A feature of particular significance in regard to epidemic influenza is its tendency to recur, often involving a secondary pneumonic infection,—streptococci, pneumococci, staphylo-

cocci, Pfeiffer's bacilli, and even meningococci, —to which the high mortality is chiefly traceable.

In the case of these three epidemic diseases, it is evident that they are essentially examples of respiratory infections. Dr. Flexner has stated that the problem of protection in diseases of this class can be solved only by methods of personal hygiene, applied on the individual scale of safeguarding one person from another. In the case of poliomyelitis, because of the difficulty in making a prompt and accurate diagnosis of the disease, there often occurs a wide distribution of the infectious agent before preventive sanitary regulations are enforced. Epidemic pneumonia, however, theoretically, should respond to methods of control based upon our knowledge of them. In the case of epidemic streptococcus pneumonia and the pneumonia following influenza, we have to deal not with pathological conditions in which extraneous micro-organisms are introduced, but with exaggerations of sporadic diseases ordinarily prevailing.

It appears that these epidemic diseases survive over long periods of time without attracting any particular attention in fixed localities, their so-called endemic homes. There is reason to believe, for instance, that an endemic form of poliomyelitis exists in northwestern Europe, and a similar one for influenza in eastern Europe, particularly on the border region between Russia and Turkestan. Dr. Flexner has suggested, in view of the difficulties attending the control of these diseases after they have become epidemic, that an effort of central rather than peripheral control should be attempted, for the purpose of eventually eradicating the diseases in the regions of their endemic survival. The possibility of suppressing such a menace to civilized man and future progress is an enterprise worthy of the consideration of all scientifically advanced countries.

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#### MEDICAL NOTES.

NEW YORK HOSPITAL DEFICIT.—The annual report of the United Hospital Fund which has been issued recently discloses the fact that the non-municipal hospitals of New York face a deficit of more than three million dollars. This deficit is reported to be due to the increased

costs of hospital operation and maintenance of free wards. An example of this increase may be cited in the fact that a free patient could be maintained in 1914 at an average cost of \$2.02, while in 1918 the average charge was \$3.13. It has been estimated that the cost per capita of nearly 150,000 patients to be treated free during the coming year will be about \$3.50.

Approximately one hundred and eighty thousand people are ill in New York every day, and probably only about one in ten of those who need hospital care are now getting it. The war has made necessary unusual economizing, and generous extra gifts are greatly needed to enable the hospitals to regain what they have lost and make the necessary advances. The following men have appointed a committee to investigate the problem and overcome the difficulties which threaten the hospitals of New York:

Robert Olyphant, Henry J. Fisher, George Blumenthal, Henry R. Kunhardt, Ivy L. Lee, William Fellowes Morgan, E. H. Onderbridge, James Speyer, Arnold Wood, William H. Kingsley, J. Pierpont Morgan, George Emilen Roosevelt, W. V. S. Thorne, Howard Townsend Allen Wardwell, Charles A. Wimpfheimer, Albert H. Wiggin, and William C. Breed.

AMERICAN REPRESENTATIVES AT INTER-ALLIED CONGRESS OF SURGEONS.—Dr. George Emerson Brewer, former professor of surgery in Columbia University, represented the United States at the inter-allied congress of surgeons which convened in Paris. For five weeks he resumed his rank as colonel in the medical division of the Army and returned to New York about the middle of November.

WAR CASUALTIES FROM POISON GAS.—A report issued by Surgeon-General Ireland, based on analysis of American casualties in France, states that poison gas is one of the most humane weapons of war; for although 74,779 of the 274,217 battle casualties resulted from gas, the number of deaths was very small—1.87 per cent. as compared with 23.4 per cent. from shell or bullet wounds. These figures indicate that a man suffering from poison gas has twelve times as many chances of recovery as a man put out of action from other causes.

ALCOHOL FOR PHYSICIANS.—It has been stated that the chief of the internal revenue agents has announced that any licensed practitioner of medicine may obtain permits, without giving bond, for the purchase of an amount of alcohol not exceeding two quarts during a period of one year by filing "Form 737" with a collector of internal revenue and executing a sworn statement to the effect that such alcohol is to be used in his practice. There have been complaints that persons ill with pneumonia have been unable to secure the whiskey needed in their treatment because physicians did not know how to get it without violating the law.

SMALLPOX ON STEAMSHIP.—The French steamship *Roma* has been held in quarantine recently at New York because of the discovery of a case of smallpox on board.

ASSOCIATION FOR PREVENTION OF TUBERCULOSIS.—At a recent meeting in Washington of the Association for the Prevention of Tuberculosis, the results of the health crusade conducted through the medium of the public schools were discussed. It was stated that there has been a steady decline in the death rate from tuberculosis in Washington since the work of the Association was begun; it has dropped from 127 per 100,000 in 1910 to 93 per 100,000 in 1917 among the white population, and from 453 to 312 among the colored.

ROCKEFELLER GIFT OF \$10,000,000 FOR RESEARCH.—A gift of \$10,000,000 has been made by John D. Rockefeller to the Rockefeller Institute for medical research. This is the largest single gift which has been made to the institution and is to meet the growing needs in many lines of work. It will make possible additional research in biology, chemistry, physics, and medicine, and will permit the general enlargement of the scope of the Institute's activities.

The scientific staff of the Rockefeller Institute numbers sixty-five men and about three hundred and ten persons are employed in its technical and general service. All discoveries and inventions made by those in the employ of the Institute are placed freely at the service of humanity. In its war activities the Institute divided its work into the following three classes: (1) establishment of teaching

courses in the surgical treatment of wounds; (2) special research work in bacteriology, immunology, bio-chemistry, or antiseptics, effects of poison gas; and (3) the production of serum on a large scale for treatment of meningitis, pneumonia, and dysentery.

**HONOR FOR MAJOR-GENERAL GORGAS.**—Major-General W. C. Gorgas has been elected an honorary member of the National Academy of Medicine of Peru.

**RETURN OF PROFESSOR ANTON J. CARLSON.**—Professor Anton J. Carlson, chairman of the Department of Physiology at the University of Chicago, has returned to his regular work at the University. In 1917, Dr. Carlson was commissioned captain in the Sanitary Corps; he was made major in 1918, and lieutenant colonel in 1919. In the spring of 1919 Dr. Carlson went to Paris and became director of the division of the American Relief Administration known as the Children's Relief Bureau. Since that time he has visited Poland, Czecho-Slovakia, Austria, Jugo-Slavia, Finland, the Baltic States, and parts of western Russia in the interest of child welfare work.

**CONTINUED DECREASE IN FRENCH POPULATION.**—The vital statistics report for the year 1918 shows that the population of France is continuing to decrease. Without counting the losses from the war, the nation numbers 389,575 less than in 1917. These figures include only the seventy-seven departments of France which were not in enemy occupation. The decline is attributed mainly to the ravages of the influenza epidemic in the latter half of 1918, from which it is computed that about 200,000 persons died. Compared with 1917, there was an increase in marriages to the number of 19,364; but the number of divorces also rose from 5,372 to 8,121.

**COLLEGE OF PHYSICIANS OF PHILADELPHIA.**—A meeting of the Section on Medical History of the College of Physicians of Philadelphia was held on November 15. "Sculpture and Paintings as Modes of Anatomical Expression" was discussed by Lieutenant-Colonel Fielding H. Garrison, M.C. U. S. Army, Washington, and Dr. Edward C. Streeter, Boston.

**APPOINTMENT OF DR. RENSRAW.**—Dr. R. R. Renshaw has been appointed assistant professor of chemical research in pharmacology at the Harvard Medical School. Dr. Renshaw was formerly associate professor of organic chemistry at Iowa State College.

**IN COMMEMORATION OF SURGEON-GENERAL STERNBERG.**—In memory of Surgeon-General George Miller Sternberg, a monument was unveiled at the National Cemetery on November 5. Addresses were delivered by Surgeon-General Merritte W. Ireland, U. S. Army; Brigadier-General Walter D. McCaw, Colonel Edward L. Munson and Colonel Frederick F. Russell, Army Medical Corps, and Dr. George M. Kober, of the George Washington University.

**WASHINGTON UNIVERSITY MEDICAL SCHOOL APPOINTMENTS.**—The Washington University Medical School has appointed Dr. Eli Kennerly Marshall, Jr., Washington, D.C., formerly associate professor of pharmacology in Johns Hopkins University, head of the Department of Pharmacology. A. W. L. Bray has been made associate in anatomy; Alfred C. Kolls, associate in pharmacology; Edgar Allen, instructor in anatomy, and Edward A. Doisy, instructor in biological chemistry.

**APPOINTMENT OF DR. EMIL GOETSCH.**—Dr. Emil Goetsch has been appointed head of the Surgical Department of Long Island College, New York. Dr. Goetsch was formerly resident surgeon of the Peter Bent Brigham Hospital, Roxbury, Massachusetts.

**LECTURES ON THE HERTER FOUNDATION.**—The tenth course of lectures on the Herter Foundation was given at the Johns Hopkins University by Henry Hallett Dale, F.R.S., director of the Department of Biochemistry and Pharmacology. Medical Research Committee on National Health Insurance, London, on the following subjects: November 13, "Capillary Poisons and Shock"; November 15, "Anaphylaxis"; "Chemical Structure and Physiological Action."

**IN MEMORY OF LORD LISTER.**—Tablets in memory of Lord Lister were unveiled on November 11 by Sir George Makins, president of the Royal College of Surgeons, and Sir J. J. Thomson, president of the Royal Society. The



tablets were executed for University College by Professor Harvard Thomas.

**THE WEIR MITCHELL ORATION.**—Dr. Charles W. Burr delivered the Weir Mitchell oration at the College of Physicians of Philadelphia on November 1. His subject was "Dr. S. Weir Mitchell as a Physician, a Man of Science, a Man of Affairs, and a Man of Letters."

**HONOR FOR SURGEON-GENERAL WILLIAM C. BRAISTED.**—Surgeon-General William C. Braisted, U. S. Navy Medical Corps, has been elected an honorary fellow of the Royal College of Surgeons at Edinburgh.

**APPOINTMENTS AT CORNELL UNIVERSITY.**—The following appointments have been made at Cornell University, completing the organization of the new department of hygiene and preventive medicine: Dr. Haven Emerson, professor of hygiene and preventive medicine, and director of the department; Dr. James Stevenson Allen, assistant professor of hygiene and preventive medicine, and assistant director of the department; Dr. Frank C. Balderry, medical adviser; Drs. J. Ralph Harris, Lawrence B. Chenowith, Richard Kimpton, Claude E. Case, and John A. Herring, assistant medical advisers for men, and Drs. Margaret D. Baker and Katherine Porter, assistant medical advisers for women.

**MEDICAL PUBLICATIONS IN BRAZIL.**—A catalogue of all medical publications that have appeared in Brazil within the last hundred years is being compiled by the National Academy of Medicine and the Surgical Society of Rio de Janeiro, and will be distributed at the celebration of the Centenary of Independence, which is to be held in 1920. At the same time, a Congress of Medicine will be held in Rio de Janeiro under the direction of the president of the Medical and Surgical Association, Professor Fernando Magalhães.

#### NEW ENGLAND NOTES.

**FRENCH ORPHANAGE FUND.**—The New England Branch of the French Orphanage Fund has acknowledged total contributions to the amount of \$523,658.33.

**BEQUESTS TO MEDICAL INSTITUTIONS.**—The

following bequests were included in the will of the late Mrs. Samuel W. Bridgman of East Providence:

New York Eye and Ear Infirmary, \$30,000; Roosevelt Hospital, \$15,000; Home for Incurables, Fordham, \$20,000; Hospital and House of Rest for Consumptives, Inwood, \$10,000; Association for the Aid of Crippled Children, New York, \$5,000; St. Luke's Hospital, New York, \$10,000; Bar Harbor Medical and Surgical Hospital, \$15,000; Rhode Island Hospital, Providence, \$10,000; Home for Consumptives, \$1,000.

**AMERICAN MEMORIAL HOSPITAL FUNDS.**—The New England Branch of the American Fund for French Wounded has announced that the funds received for the American Memorial Hospital have reached the following amount. \$261,196.68.

#### BOSTON AND MASSACHUSETTS.

**WEEK'S DEATH RATE IN BOSTON.**—During the week ending November 22, the number of deaths reported was 193 against 257 last year, with a rate of 12.64 against 17.09 last year. There were 25 deaths under one year of age against 43 last year.

The number of cases of principal reportable diseases were: Diphtheria, 96; scarlet fever, 71; measles, 142; whooping cough, 40; typhoid fever, 5; tuberculosis, 47.

Included in the above were the following cases of non-residents: Diphtheria, 16; scarlet fever, 16; typhoid fever, 2; tuberculosis, 9.

Total deaths from these diseases were: Diphtheria, 3; measles 1; whooping cough, 2; typhoid fever, 1; tuberculosis, 13.

Included in the above were the following non-residents: Tuberculosis, 3.

Influenza cases, 15; influenza deaths, 2.

During the week ending November 29, 1919, the number of deaths reported was 208 against 241 last year, with a rate of 13.62 against 16.02 last year. There were 36 deaths under one year of age against 36 last year.

The number of cases of principal reportable diseases were: Diphtheria, 59; scarlet fever, 65; measles, 145; whooping cough, 38; tuberculosis, 34.

Included in the above were the following cases of non-residents: Diphtheria, 8; scarlet fever 9; measles, 145; tuberculosis, 3.

Total deaths from these diseases were: Diphtheria, 1; measles, 3; whooping cough, 1; tuberculosis, 18.

Included in the above were the following non-residents: Diphtheria, 1; measles, 1; tuberculosis, 1.

Influenza cases, 9.

**AWARD OF DEGREES TO MASSACHUSETTS SURGEONS.**—At the seventh convocation of the American College of Surgeons held in New York on October 24, the degree of F.A.C.S. was awarded to the following men from Massachusetts:

Charles Roger Abbott, Clinton; William A. Brooks, Boston; Dudley Carleton, Springfield; Arthur Hallam Crosbie, Boston; Hilbert Francis Day, Boston; D. W. Drury, Boston; Martin Thomas Field, Salem; Edgar A. Fisher, Worcester; Henry J. FitzSimmons, Boston; Ralph W. French, Fall River; Joseph Lincoln Goodale, Boston; Charles M. Green, Boston; George Hillard Hill, Worcester; Edward Daniel Hurley, Boston; Thomas Kittredge, Salem; Halsey Beach Loder, Boston; Edward H. Mackay Clinton; George Andrew Moore, Palmer; George W. Morse, Boston; Edwin Wallace Smith, Boston; Frank Dahnon Stafford, North Adams; Charles Douglas Wheeler, Worcester.

**BOSTON CITY HOSPITAL.**—The December clinical meeting of the Boston City Hospital was held on Thursday, December 4, 1919, at 8.15 P.M., in the Cheever Surgical Amphitheatre. The profession, graduate and undergraduate, is cordially invited to these meetings, held on the first Thursday of the month. At this meeting there were case demonstrations, and an address was delivered by Dr. Timothy Leary. The subject was discussed by Dr. Nichols and Dr. Robie.

**THE CUTTER LECTURES ON PREVENTIVE MEDICINE.**—The Cutter Lectures on Preventive Medicine, by T. M. Legge, M.D., D.P.H., His Majesty's Inspector of Factories and Lecturer on Factory Hygiene, University of Manchester, London, was held on December 8, 9, and 10, and included the following topics: "Twenty Years' Experience of the Notification of Industrial Diseases under the Workmen's Compensation Act"; "Medical Supervision in Factories"; "Industrial Diseases under the Workmen's Compensation Act." These lectures are open to all members of the classes in the

Medical School, the medical profession, and others interested in these subjects.

**WORCESTER DISTRICT MEDICAL SOCIETY.**—A meeting of the Worcester District Medical Society was held on November 12 in Worcester. Dr. George Van Ness Dearborn of Cambridge read a paper on "Blood Pressure."

**SPRINGFIELD ACADEMY OF MEDICINE.**—At a meeting of the Springfield Academy of Medicine on November 11, Dr. Ernest A. Codman of Boston delivered an address on "Intestinal Obstruction."

**APPOINTMENT OF CAPTAIN GEORGE F. FREEMAN AS MEDICAL AIDE.**—Captain George F. Freeman, U.S.N., Medical Corps, has been appointed medical aide of the First Naval District, to succeed Captain John M. Edgar. Dr. Freeman is a native of Massachusetts and was appointed to the service June 7, 1900.

## Correspondence.

### CONTROL OF COMMUNICABLE DISEASES.

*Mr. Editor:*—

I beg to call your attention to unusual conditions that exist in the state at this time.

Scarlet fever and diphtheria are showing an unusual incidence in all sections of the state and this increase is due, almost without exception, to infection of households from incomplete isolation of the infected case and from mild cases to which physicians have not been called. To prevent this laxity of isolation and quarantine, you are advised to "tighten up" on the follow-up work of your inspectors. In the "missed" or "undiagnosed" cases advise your local school inspectors to watch assiduously for the return of children to school following an unexplained absence. Many children are now in school who show either the prodromal symptoms of scarlet fever or by peeling give evidence of recently having had the disease.

Owing to the high cost of living, people are not employing physicians except in extreme need and it becomes necessary, therefore, that our school inspections be even more carefully done than ever before. It would be well, especially in school rooms where a case of diphtheria or scarlet fever has been found, to combine with the inspection the daily taking of temperatures by a school nurse. All those showing a slight increase in temperature should be sent home for observation.

Smallpox is unduly prevalent in Canada and in the provinces. The form is apparently mild and it therefore becomes necessary to view all cases of chicken-pox as potential smallpox until the diagnosis has been made definitely.

I again urge the necessity of vaccination of all unvaccinated school children and believe it is well to bear in mind that immunity conferred by vaccination is not permanent and, therefore, all contacts with a known case or suspected contacts should be vaccinated unless they give evidence of recent vaccination or of having had the disease.

Very truly yours,

EUGENE R. KELLEY, M.D.,  
Commissioner of Health.

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## Original Articles.

### VACCINES IN INFLUENZA.

By W. H. WATTERS, M.D., BOSTON,

*Pathologist, Massachusetts Homeopathic Hospital.*

EARLY in September, 1918, the epidemic of influenza that had been raging in certain parts of Europe made its expected appearance in America. The first outbreak occurred in the Boston district and from here to a large extent it spread over the entire country. At this time comparatively little was known about it by the American medical world, although its arrival had been clearly foreseen by many. Since then all of the many phases have been studied by most competent men from the Atlantic to the Pacific; and, literally, volumes have been written concerning it.

It is not, therefore, with the expectation of adding anything new to these accumulated data that the writer has prepared this article, but merely with the desire to add the results of a somewhat extensive personal experience of one who happened to have a very early opportunity to study the cases at first hand.

Starting in the Chelsea Naval Hospital, the number of cases almost immediately exceeded all accommodations. The Haynes Memorial for

Contagious Diseases, a department of the Massachusetts Homeopathic Hospital, was offered to the Government and was accepted, the personnel of the institution and its directors being continued as before. Here and later in the main hospital many hundreds of cases of influenza and its complications were treated during the next two months. Other phases than attempts at immunization will at this time be entirely eliminated on account of space limitations.

Prior to this time, Dr. Timothy Leary of Tufts Medical School, and the writer had discussed the possibilities of vaccines in this disease and had agreed that their administration was at least logical from the prophylactic standpoint.

Immediately upon the arrival of these cases at the Haynes Memorial, Dr. Leary made a large number of cultures and from these obtained his first vaccine. To Dr. Leary, therefore, belongs the credit of first applying vaccines as a prophylactic measure. The writer also obtained cultures, prepared vaccines, and administered them. Neither was able to isolate or then discover the so-called influenza bacillus, the organism predominating being a diplococcus, doubtless of the group of the *Micrococcus catarrhalis*. Very shortly, however,

post-mortem examinations of fatal cases revealed the influenza bacilli in the lungs and pure cultures were obtained. From this time onward the two investigators varied. One, Dr. Leary, decided to prepare his vaccine from various strains of influenza bacilli alone; the other, the writer, assuming that a mixed infection was active in various phases of the disease, prepared a vaccine with various bacteria included. The following is a report of the latter study:

From the lungs at post-mortem examinations a number of organisms were isolated and from these a mixed vaccine was prepared as follows:

<i>Micrococcus catarrhalis</i> .....	400	million
<i>Pneumococcus</i> .....	400	"
<i>Streptococcus hemolyticus</i> .....	400	"
<i>Bacillus influenzae</i> .....	100	"

Of this, the recommended dosage was .2 c.c., .3 c.c., and .4 c.c., administered at 3-day intervals. It was stated that the procedure was experimental, was theoretically logical, and was relatively harmless, and the duration of its efficiency would probably be about four weeks. Public clinics were opened where it could be obtained by any one, free of charge, and large amounts were distributed to physicians and boards of health without charge, the only proviso being that it should be similarly freely administered. In all a sufficient supply was sent out for about fifty thousand doses. A request accompanied each lot that records of results be kept and returned. As might be expected, however, in the most unusual stress of sickness and death, a large number of such records were either lost or not made. From one state department of health, in particular, to which thousands of doses were sent, no adequate report was ever obtainable. Many reports did come in, however, frequently accompanied by comments from the one submitting them. These coming as they did, from trained observers entirely unbiased either for or against the method, seem to be of sufficient value to justify placing them on record.

The first immunizations were upon the laboratory staff itself. Here, of the total fourteen, ten received inoculations. None of these contracted the disease. Of the four others, two had influenza rather severely. This seemed rather suggestive because all were in close and intimate contact with a great many cases continually. Among the nurses inoculations were

offered as optional and were begun practically as soon as the epidemic appeared. For the combined senior and intermediate classes the statistics have been collected, but, unfortunately, those for the lower classes were lost in the stress of active work.

For the two upper classes the results are as follows:

		SICK	PER CENT. SICK
Not vaccinated .....	41	33	80
Vaccinated once .....	27	9	33
Vaccinated twice .....	9	3	33
Vaccinated three times	6	2	33

The high disease incidence here was undoubtedly due to the fact that all these nurses were constantly and continually exposed to the infection in caring for the hundreds of cases in their wards and were exposed under conditions of physical and mental fatigue that were almost ideally favorable to the contagion.

In the eatgut factory of W. D. Young & Co., in one room where the raw gut was manufactured, nineteen employees were inoculated and one refused. Within a week, the only case of the disease that had occurred was the one un-inoculated individual.

Among the commercial firms of the city, many desired or requested the treatment. Perhaps the most carefully controlled study was here made among the employees of the H. P. Hood Milk Co., with the very efficient coöperation of the medical supervisor, Dr. N. R. Davis, who superintended the entire work. Upon the first appearance of the epidemic, Dr. Davis foresaw the coming storm and recommended that all of the employees be immunized. At this time an occasional worker was sick but the number was very insignificant. Injections were immediately begun and vigorously carried forward. Following the subsidence of the epidemic wave, Dr. Davis carefully collected statistics comparing the results among those immunized and those not immunized. These, he reports as follows:

	NON- VACCINATED	VACCINATED
No. persons under observation	300	247
No. cases of influenza .....	93	17*
No. cases of pneumonia .....	5	2†
Percentage of influenza .....	31	6.8
Percentage influenza mortality	4.3	0

Dr. Davis states "that the majority of these people were route salesmen whose duties took them in all kinds of homes during this epi-

\* This includes six with only one inoculation and five with two inoculations.

† These each received but one inoculation.

demic. They were out in all kinds of weather and some of them had to take the pocketbook from underneath the mattress of people who were ill, to get their money. The other people were men and women in the office. A great many of our force were ill with influenza who did not care to be vaccinated. These employees were equally exposed."

At the same time a similar study was being conducted at the Boston Confectionery Co. The results may be thus summarized:

	NOT VACCINATED	VACCINATED
<i>Boston Confectionery Co.</i>		
No. persons under observation	200	250
No. cases of influenza	75	3
No. cases of pneumonia	4	0
Percentage of influenza	30	0.8
Percentage influenza mortality	2.7	0
<i>F. H. Roberts Co.</i>		
No. persons under observation	339	329
No. cases of influenza	9	3
No. cases of pneumonia	1	0
Percentage of influenza	2.7	0.9
Percentage influenza mortality	11	0
<i>Miller Candy Co.</i>		
No. persons under observation	25	90
No. cases of influenza	18	5
No. cases of pneumonia	1	0
Percentage of influenza	72	5.5
<i>Lorrell &amp; Covell Co.</i>		
No. persons under observation	100	185
No. cases of influenza	90*	0
No. cases of pneumonia	?	0
Percentage of influenza	90	0

\* The majority of these cases contracted the disease prior to the time when their associates were vaccinated. Therefore comparative deductions must be made with caution.

A little later word came that the epidemic had appeared in the male wards of the Allentown State Hospital in Pennsylvania. A supply of vaccine was immediately sent to Dr. L. B. Pierce, from whose report the following facts are taken. The outbreak started and spread rapidly among the buildings for males and when the vaccine was received had practically not appeared in the buildings for females. Immunization attempts were therefore largely directed to the uninvolved departments, although a few in the other parts were treated. The report includes accordingly largely a comparison of disease incidence morbidity and mortality between a non-immunized department and an immunized one, both presumably equally exposed to infection. The results are interesting:

	NOT VACCINATED	VACCINATED
<i>Allentown State Hospital.</i>		
No. of cases under observation	575	722
No. of cases of influenza	186	41*
No. cases of pneumonia	77	11*
Percentage of influenza	32.4	8.4
Percentage influenza mortality	17.7	13.1

\* Of these, 13 had received but one, and eight, two inoculations.  
† Of these, three had received but one, and two, two inoculations.

Of the 61 cases vaccinated 22 showed the disease in less than one week, three from the first to the fourth week, 18 after the fifth week, 17 after the fifth. This suggests the onset of the immunity to be about one week, the persistence of its highest efficiency about three or four weeks, and its gradual disappearance thereafter. Dr. Pierce states that "the epidemic among the women came later, after the inoculations were completed, and was much less severe in character, those who had the disease exhibiting it in a much milder form. It would look as if the vaccine must have been at least a factor in this result."

The writer in person in association with the Bridgeport Board of Health, organized the immunizing staff of the Remington Arms Company and the Bullard Machine Works. On account of the relatively light course of the epidemic here and the sudden disarticulation of lines of work in these industries subsequent to the armistice, full reports were not obtainable. From the report of the Board of Health, however, the following is abstracted:

	No. RECEIVING 1 INOCULA- TION	No. RECEIVING 2 INOCULA- TIONS	No. RECEIVING 3 INOCULA- TIONS
Remington Arms	1079	905	660
Bullard Machine	1069	707	409
Bridgeport Brass	846	576	400
TOTAL	3024	2188	1469
GRAND TOTAL OF INOCULATIONS	6681		

### Results:

It was impossible to follow up closely all of the cases that were vaccinated. Except in a general way there is nothing that can be said of cases in the Remington Arms and Bridgeport Brass Co. The physicians at these factories report that the cases of influenza materially decreased, that there were no severe cases after the vaccinations and that only a few men reported to them with any of the symptoms. However, this does not apply particularly to the vaccinated group, but to the entire factory. It may have been due to the fact that the epidemic has reached its height at about this time and that the decrease of cases would have followed even if there had been no inoculations.

In one case, the arm was swollen and became very painful after the first inoculation and continued in this condition for two or three days. In another case, a very severe headache resulted and there was a general reaction

which lasted for two or three days. The other two cases did not seem to be important. One man tried to faint as the vaccine had been given, claiming that his head and arm hurt. Another case reported a stiff arm the next day.

There were three cases and one death among the men vaccinated at the Bullard factory. Two of these cases, including one that died, had received only one inoculation and probably had the infection before he was vaccinated. It was also reported by the physician that the patient who died had other serious complications which contributed to his death. The third case had had two inoculations before the onset of the disease, but his illness was not severe. Several cases, with no deaths, were reported at this factory among the unvaccinated employees. There was no practical way in which records could be obtained on the unvaccinated group so that the actual number of cases is not known."

From various other boards of health, the reports are either entirely missing or are so sketchy as to be practically valueless. To practicing physicians the vaccine was sent in abundance. The reports that were submitted may be summarized as follows:

DOCTOR	No. INOCU- LATED	No. CONTRACT- ING DISEASES	PNEUMONIA CASES	DEATHS
Barney .....	47	None	None	None
Bell .....	25	"	"	"
Bowen .....	200	1	"	"
Cahill .....	40	None	"	"
Collins .....	13	"	"	"
Cross .....	48	2	"	"
Emerson .....	39	"	"	"
Gould .....	30	1	1	"
Hanson .....	30	None	None	None
Johnson .....	6	"	"	"
Jones .....	123	5	"	"
Kirkland .....	160	2	"	"
Leard .....	160	3	"	"
Leeds .....	2	None	"	"
Phillips .....	105	"	"	"
Piper .....	31	None	None	None
Rice .....	98	"	"	"
Rhiz .....	26	5	"	"
Southwick .....	125	None	"	"
Sylvester .....	88	2	1	"
Ventrone .....	60	None	None	"
Weston .....	2	"	"	"
Woodbridge .....	75	"	"	"

Dr. Barney: There is no comparison in my cases, as everyone inoculated has escaped the disease with possibly one exception. I am not quite sure of the diagnosis yet. Some of the patients inoculated were intimately and continuously exposed, three of them being nurses. They escaped. In three other instances all members of the family had influenza except the one inoculated, who was intimately associated with the other members. I am very en-

thusiastic in regard to the influenza prophylactic vaccine.

Dr. Bell: Prophylactic measure seemed of value.

Dr. Bowen: I used the prophylactic vaccine in a great many cases all the way from six months to 60 years, and while I do not wish to be over enthusiastic will say that I am confident it does not do to neglect it as one of the prophylactic measures.

Dr. Cahill: It seemed in general that I found the disease in 70% of the same number of uninoculated persons under same conditions and in same length of time.

Dr. Emerson: I see absolutely no objections to the method and so far as I know no one to whom I gave the vaccine has had the "flu."

Dr. Gould: I am sure it must have been of much service.

Dr. Jones: Personally I feel that this method of inoculation is very valuable in preventing and modifying the severity of influenza and pneumonia.

Dr. Leard: The doctor states under date of December 1st, two months after inoculations, that since filling out the above record he has had several cases ranging from light to severe.

Dr. Phillips: During the first three weeks of the epidemic and following the inoculations, not a case occurred among our nurses, while in the other hospitals here nurses by the dozens were attacked, and many died. In the fourth week, however, one after another of the ten came down. I think the explanation is that their immunity was short lived, and only partial, and that we would have done much better had we continued the vaccine until reaction ceased to fairly large doses. Only one patient outside the hospital who was inoculated came down with the infection.

Dr. Piper: In several cases, four at least, I gave prophylactic vaccine to persons who were much exposed to patients ill with influenza and in no instance did persons so treated contract the disease. I am confident the vaccine is a helpful measure.

Dr. Rice: Not quite fair in my case because the disease was rather on the wane when inoculation began.

Dr. Southwick: I have great confidence in the prophylactic value of the influenza vaccine prepared by Prof. Watters. I used in most of the cases one-third larger dose than the amount originally recommended.

Dr. Sylvester: I found that 75% of household contracted it if not inoculated, while only two out of all treated contracted same. I feel it was a decided benefit.

Dr. Ventrone: Those inoculated, according to my experience, were immune.

Dr. Woodbridge: Personally we inoculated about seventy-five cases and as far as we know not one case developed influenza. We inocu-

lated one prospective confinement case after she had been exposed to influenza and she developed a severe attack of pneumonia, but recovered without having a miscarriage.

It will be seen that there is practically a unanimity of opinion in favor of the idea that active immunization by the use of vaccines may be obtained, a fact which while not, of course, to be considered as scientific proof, still should be considered to have distinct value. Another interesting note is found in the comment upon reactions. These, while infrequent, were almost always mistaken for the beginning of influenza, being characterized by sudden chill, fever, headache and prostration, persisting for a few hours and subsiding gradually.

It may be of further value to note in combining the above figures, excluding the Bridgeport Board of Health and the Lovell & Covell Company, where comparisons are indefinite, that there was disease incidence among those inoculated of approximately 3.5%, while at the same time among others not inoculated the disease incidence amounted to 28% and under similar surroundings. Among those immunized the incidence of pneumonia was very low, there being only fifteen cases definitely reported. The total of eight deaths has been reported, these all coming from the Allentown State Hospital where three of the patients had received but one inoculation and three, two inoculations. Apart from this the mortality records are clear.

In preparing this paper, the writer fully realizes the fact that epidemics afflict first those most susceptible and that measures for immunization employed later upon those not yet infected may consist of administering them to persons already naturally immune. As such, it is obviously unfair to compare early morbidity among a non-immunized community and later morbidity among a hopefully partially immunized one after the most susceptible have already become diseased.

In the Allentown report, however, this possibility seems to be successfully met when it is noted that of those vaccinated persons contracting the disease 36% did so within one week of the first inoculation when the immunity should be theoretically only beginning and, 57% did so after the fourth week when the immunity was decreasing. It would suggest that for a period of three or four weeks, a distinct degree of resistance to infection might be produced.

Again, in the report of Dr. Phillips, no inoculated nurses in the hospital with which he is associated contracted the disease until after three weeks subsequent to inoculation, even though constantly exposed.

Dr. Leard also reports occurrence of the disease in vaccinated cases later than four weeks after inoculation.

These notes seem strongly to suggest that there is a period of three to five weeks subsequent to inoculation during which a distinct degree of immunity exists.

With these facts in mind and even with the incomplete returns necessarily incident to an almost unprecedented epidemic at a time when the medical profession of the country was seriously depleted by war, it has seemed that the results reported in this article deserve to be thus recorded.

#### PRIMARY SARCOMA OF THE STOMACH. REVIEW OF THE CASE SIX YEARS AFTER OPERATION.

By A. R. KIMPTON, M.D., F.A.C.S., BOSTON.

In June, 1914, in this JOURNAL,<sup>1</sup> the case of round celled sarcoma of the stomach which is here to be reviewed was reported. Coincidentally Frazier<sup>2</sup> published an article on gastric sarcoma in which he states that of 12 cases of sarcoma of the stomach the longest period of survival after operation was 14 years, while the remaining cases survived "2 two years, 1 one year, 1 had recurrence in three years, and 8 were reported as well from two to eleven months after operation."

The following case is of particular interest in that the patient is alive and perfectly well, with no evidence of return of the sarcoma five years and ten months after an extensive resection of the stomach for a very rapidly growing sarcoma of the round celled type. She is able to drive, oil and grease, and even change the tires of her own car.

(Quotation from JOURNAL of June 11, 1914.)<sup>1</sup>

"The following case is of interest, not only because of the comparative rarity of gastric sarcoma, but also because of the fact that the patient was known to have had an abdominal tumor for years. Yet at the time of operation she was not anemic or emaciated, nor did she have any gastric symptoms other than indigestion (apparently hyperacidity)."

*History.* Physician's wife, 30 years of age. Father and mother living and well. Remainder of family well. As a small girl from three to five years of age, she was subject to severe attacks of pain in epigastrium and other regions of the abdomen. These attacks lasted until relieved by drugs, and were followed by great weakness lasting three or four days. The physicians called were unable to assign any cause. On one occasion ether was administered to relieve the patient. Menses began at eleven years of age. As a young girl she was troubled a great deal with "sour stomach," and at the time of her marriage was in the habit of taking a large amount of sodium bicarbonate, which she gradually ceased to do, and for eighteen months had no trouble at all with her stomach.

Patient states that she discovered the tumor when eleven years old, but never spoke of it until after marriage, four years ago. It has troubled her more or less by occasionally being sore and painful. Within the last two years the tumor has increased in size gradually and has given more discomfort in every way. The digestive upsets have been more frequent, at times necessitating only liquid diet, but the patient never vomited.

With the exception of these attacks of "indigestion" the patient considered herself in perfect health and certainly appeared perfectly well.

*Operation.* December 29, 1913. Abdomen opened through an incision made below the umbilicus. Pelvic contents were found to be normal and a movable mass was found in the upper abdomen, which could be pulled down as far as the umbilicus. There were no adhesions. Extending the incision to a little above the umbilicus, it was found that a tumor of the stomach was to be dealt with. There was not only the large tumor, but many smaller ones. . . . The tumor mass was local, so far as could be made out, although there were palpable somewhat enlarged lumbar nodes. A partial resection of the stomach was decided upon. It was necessary to resect so low on the duodenum that the stump was turned in with considerable difficulty. The stomach, likewise, had to be resected high in order to take in all of the tumor. The resection was done with an actual cautery. The lines of suture were reinforced with omentum so far as possible. The remaining portion of the stomach

was so small that a posterior gastro-enterostomy was accomplished with some difficulty. There were some enlarged nodes along the greater curvature of the stomach which were removed with the tumor. A cigarette drain was left in the upper abdomen and the abdomen closed in layers. The patient went back to bed in excellent condition with a pulse of 110. The drain was removed on the second day and was not replaced. The convalescence was uneventful throughout.

The patient left the hospital on the twenty-first day, having lost only three pounds in weight, and since then has been in perfect health. A bismuth x-ray was taken six weeks after the operation by Dr. George, as shown by the illustration. The specimen (see illustration) was examined by Dr. William F. Whitney, and his report is as follows:

*Microscopic Examination* showed a solid growth of irregularly rounded cells separated into small lobules by connective tissue bundles, and with but little intercellular substance between the cells. In many of the cells the nuclei were eccentric. Here and there were mitotic figures and double nuclei were occasionally seen.

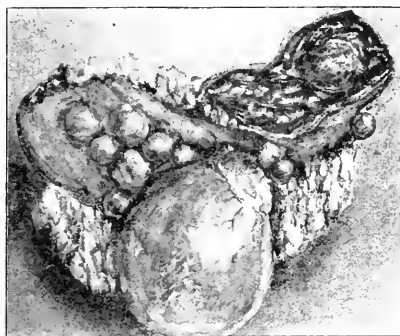
*Diagnosis.* Round cell sarcoma. The small tumors were examined as well as the larger. As the drawing shows, the tumors varied in size, some being pedunculated; were largely at the pyloric end of the stomach and did not cause any stenosis. The largest tumor was partly broken down. This is the usual condition found in the round-celled type, which is the most common type of gastric sarcoma."

A second bismuth x-ray was taken April 24, 1918, four years and four months after operation (see illustration). It shows no indication of recurrence of the sarcoma.

Although primary sarcoma of the stomach is not the rarity it was once thought to be, it is still uncommon enough<sup>3</sup> to warrant careful study of such cases. The proportion of sarcoma, among malignancies of the stomach, is usually stated now as low as two per cent.,<sup>4</sup> but might be higher were it not that sarcoma of the stomach is frequently mistaken for carcinoma<sup>5</sup> and so is recorded erroneously.

<sup>3</sup> The character of the sarcoma that was found in this case would lead us to expect an early recurrence, because the small round-celled type is the one most likely to metastasize. Warner





A. W. George

BISMUTH X-RAY FOUR YEARS AND FOUR MONTHS AFTER OPERATION.



A. W. George

BISMUTH X-RAY SIX MONTHS AFTER OPERATION.

has divided sarcoma of the stomach into four groups, according to their origin. The true fibro-sarcoma arises from connective tissue, the leiomyo-sarcoma from smooth muscle cells of the wall of the stomach, the lympho-sarcoma from the lymphoid-nodules (this, according to

Mallory, in its scirrhus form is known as Hodgkin's disease), and endothelioma from the endothelial cells of the blood vessels. By some writers endothelium is not classified as a form of the tumors of this tissue under sarcoma. It

will be remembered that a sarcoma is a non-epithelial malignant tumor.<sup>5</sup>

Warner says that leiomyo-sarcoma is the slowest in growth, and least likely to metastasize. Lympho-sarcoma is the form of gastric sarcoma which most frequently results in metastasis. Any round celled sarcoma may look like lympho-sarcoma, but on more careful examination with differential stains it may prove to be derived from smooth muscle or from fibroblasts. In other words, this tumor, although round celled, might belong to the leiomyo-sarcomatous group. If so its failure to reappear might be expected, were it not for the fact that the very *rapidity* of their growth would explain the presence of round cells in the neoplasm. The round cells found in this sarcoma if not primarily lymphoid cells of the more malignant lympho-sarcoma, are to be accounted for because they have increased so rapidly that they have had no opportunity for development into the spindle form of cell that is typical of the leiomyo-sarcoma when it is less readily metastatic.

Since it is known that an abdominal tumor had existed in this patient for years it is possible that the tumor was originally a leiomyoma that has taken on malignant properties. Whether this case, then, is a rapidly growing form of leiomyo-sarcoma or a lympho-sarcoma, a recurrence might have been expected earlier than five years after operation. It is to be hoped that, nine years later, this case will be alive to be reported as surpassing the record that Frazier has given of 14 years' survival after operation for sarcoma of the stomach.

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## FUNCTIONAL HEART DISTURBANCES IN WOMEN.\*

BY FLORENCE L. MEREDITH, M.D., NEW YORK,

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IN the physical examinations conducted at the above clinic and at a large factory and a girls' college in Boston, the conclusion has been reached that a very much larger number of girls and women between the ages of 16 and 30 show signs of cardiac feebleness than would be supposed. Myocardial sub-development, a term which seems to describe it best, gives physical signs which have often caused these cases to be accounted for on the grounds of valvular disease, myocarditis, faulty innervation or anemia. Many of these cases have been called "nervous heart," in which the nerves were undoubtedly doing the best they could with the poor material in the heart muscle upon which to work. Frequently they have been called "weak" heart, without indicating to the patient that the heart muscle is only functionally weak, and not weak from disease, and without associating the weak heart with the general weak musculature throughout the body. Many cases in which the two were associated, and both attributable to lack of suitable bodily activity, have had treatment prescribed based on such a diagnosis, and have responded in such a way as to confirm the diagnosis.

Data are available on 2,000 examinations, in about 800 of which under-development of the myocardium was found. The examinations were taken for determining fitness for admission into college, fitness for work in industrial and other lines, fitness for gymnasium work, and for general prophylactic purposes. For the most part the girls examined belonged to the working class. Out of the given 2,000, 1,500 were factory or mill operatives, 300 being store or office clerks, the remaining 200 being students, teachers, home workers and the like.

It was found that out of these 2,000, 800, or 40%, had feeble but otherwise normal hearts; 200, or 10%, were considered probably, or defi-

\* Address given on September 15, 1919, before a national conference of women doctors in New York.

## DESTRUCTION OF MEDICAL RECORDS BY FIRE.

—A fire which destroyed McCoy Hall and other buildings of the Johns Hopkins University on November 27 resulted in the loss of valuable libraries and records of the school of hygiene and public health, which occupied the second floor of McCoy Hall.

nately, organic; 40 cases, or 2%, seemed to be normal hearts somewhat strained. In the 800 cases of myocardial sub-development the symptoms most commonly found were murmurs, tachycardia, and irregularity. Seven hundred and ten had murmurs; 520 some degree of tachycardia; 390 had some irregularity: 275 cases showed all three signs. Very few who had either tachycardia or irregularity alone were considered in this classification.

The murmurs were chiefly located at the apex and the base of the heart, usually heard at both areas, sometimes more pronounced in one, sometimes in another area, varying in individuals from day to day occasionally. They were not transmitted as a rule, but in thin subjects were often heard in the axilla or back. They were generally rather soft, vague murmurs, systolic in time, and usually taking the place of the first sound, the second sound being often soft and hazy. They were variously heard as follows:

40% heard in all positions after both rest and activity.

37% heard only after activity, but in any position.

23% heard only after activity, but only in recumbent position.

These hearts were normal in size except in a few cases when a change of work or habits put a new sudden strain on the heart, when they were found dilated. With proper care they practically all returned to normal size, although some showed a definite tendency to dilate. The sound of the heart was abnormal not only in relation to adventitious sounds. In the 48% of girls who had no murmurs, the diagnosis of myocardial subdevelopment was made in 18% on account of the indefinite feeble sounds without murmurs.

Irregularity of beat was a feature in 390 cases, or 49% of the 800 under discussion. The irregularity was usually not very pronounced and seldom in any way systematic. In most of the cases it became somewhat more pronounced on exertion: in 30% remained the same and in 20% it disappeared, but in each of these it recurred when the exercise was unduly prolonged. We found that arm exercises brought out irregularity more than leg ones, and holding the breath while exercising had the worst effect of all. Tachycardia after exertion was

present in 520, or 65%, of cases, all of the cases having more than a normal increase on moderate exertion. In some of the cases the pulse rate had been uncommonly slow before exertion. The average pulse rate at rest was about what we have found in normal girls, being 75-80 in 80% of the cases.

The pulse rate of women when examined by women seems to be somewhat lower than the statistics given by men would indicate. Unquestionably a psychic factor of some kind must be responsible for a rise in pulse, for women physicians have often observed a lower pulse in women than they had been given to expect by the data based on the findings of men. The only one with whom I have talked who has found pulses high happens to be a very austere, cold, unfriendly person with a very so-called professional manner towards her patients. She finds blood pressures quite low and tremor of the fingers in many cases. We shall have to learn that in order to get scientifically correct findings we must have the body as little disturbed psychically as possible. For this reason all examinations on which there is something pending are more or less unreliable, unless we succeed in drawing emphasis away from this aspect of the case.

The average increase in rate after a definite amount of exercise was 20 beats; in normal girls only 5-10 beats increase was common. It has been my custom to use as nearly as possible the same quantity of exertion in each case, when not contraindicated, in order to have a criterion of increase in rate. In girls of this variety of physical development I have used jumping up and down ten times on each foot and then, with the arms extended above the head, bending forward so as to touch the fingers to the floor or as near as possible, five times. This is usually not contraindicated, but will produce a marked change in heart action. The heart, of course, is examined first at rest. The reason for using the same amount of exercise in all cases is the same as for taking the pulse on the same artery in the same place with the same finger as regularly as possible,—so that the normal amount of increase will gradually become familiar, and unusual increase or change more quickly noted. The girl with poor muscular development, as a rule, does not use as many foot pounds of energy in doing these exercises as the vigorous girl, which fact must

be taken into consideration. Sometimes a girl really cannot be coaxed into exerting herself at all in the above given ways, in which case further efforts, such as running or climbing stairs may be used. After the definite amount of exercise the heart is quickly examined with the patient standing, then with the patient recumbent. The patient still remaining recumbent while other parts of the examination are being done, the heart is examined again after two minutes, and again after five minutes. It has been found that the rate drops rather more quickly than in organic disease and is usually normal in rate after the five-minute interval, although irregularity often persists for as long as half an hour when it was not even present at rest. No cases were included in which there was any other well defined cause of tachycardia, such as possible hyperthyroidism or tuberculosis, or cases in which tachycardia was a very marked sign in the resting heart.

The blood pressure was uniformly low. In 10% of the cases, 80, it was below 100 systolic. The pulse pressure averaged about 30-35 degrees. In a number of cases, however, with the systolic pressure low the pulse pressure was around 60. This could be attributed to the fact that there was a lack of proportion between the weak heart muscle and the arteries already losing the elasticity of youth. No albumen was found in the urine in any of these cases.

Anemia below 80% was found in only 25% of the cases. If the anemia in these cases was responsible for the murmurs, I believe it was by way of causing poor nourishment of the heart muscle and was certainly only partly responsible for the heart condition.

Respiration was commonly very slow except after exertion, when it became rapid and quite labored if the exercise was protracted. The respiratory incursion was ordinarily very limited. The intercostal angle averaged 33.5 degrees and there were often marked supra- and infra-clavicular depressions indicating limited use of the lungs. The chest was often flat and the back rounded. Cog-wheel breathing was frequently found on deep inspiration when at rest. After exercise when respiration was deepened it usually lost its cog-wheel character. It seems that an analogy may be drawn between the cardiac irregularity which disappears on exercise and the cog-wheel breathing which does the same in under developed girls, neither hav-

ing pathological significance, but due to the difficulty in performing slow motions smoothly by weak muscles. While the gymnast can lower his body slowly by bending at the knees, the untrained person can sink evenly only if he goes down rapidly, and will wobble and jerk if asked to do it slowly. The physiologist will have to explain the facts in regard to nerve and muscle which are at the bottom of this, but it apparently does account for some of the irregularity which disappears on exercise. Unfortunately most of it does not disappear, but the explanation of this is a little simpler.

There was no dyspnoea at rest in any of these cases, for such cases were not included in the series. But there was considerable difficulty in breathing on slight exertion, and use of the accessory muscles, including the alae of the nose, was frequent.

Palpitation was fairly common, but was usually found to be associated with indigestion. My impression is, however, that normally strong hearts would not be urged on to palpitation by a cause as slight as influences these hearts. One case of paroxysmal palpitation has been included in this series because, on account of refusal of any other treatment, she was given graduated general exercise experimentally, to see whether the heart muscle could be developed in this as in other cases. She steadily improved and ultimately recovered, although the case was thought at first to be one requiring quite other treatment. That there is a psychic factor present in some cases of palpitation has been observed frequently. The girls having experienced it once believe their hearts to be affected and are consequently frightened into realization of their fears in repeated palpitation on slight cause.

Electrocardiograms were done in many cases, but in none was this responsible for changing the diagnosis of a normal but feebly acting heart.

As a rule the girls who used either tea, coffee, or cigarettes to any very great extent were not included in the series, nor were girls who had any other possible toxemic factor such as intestinal stasis or foci of infection. It was thought that where any possible etiological factor could be found or anything found in the history which pointed to organic disease, it was only fair not to include them in a list of functional hearts, although probably many were such, and

although most of them were treated as such after endeavoring to eliminate the possible toxic condition.

The nourishment of these girls, like their muscular development, was usually poor. A large proportion were almost emaciated. Only 30% were up to the average in weight. Thirty-seven were rather obese, but only two were suspected of fatty degeneration of the heart.

The general condition of the girls, however, had little uniformity save in one respect, that they were practically all under-developed muscularly throughout the body. Strength tests, which in a group of entirely normal individuals averaged about 325 points and which in a few athletic ex-army men ran to 600 points, in a group of these girls averaged about 175 points. A general impression of the others is that 200 would be a good average. This grading is on a given series of tests on hands, arms, chest, shoulders, legs, and back.

The girls have habitually refrained from taking sufficient exercise to require normal development of the general musculature and the heart. While many of them did considerable hard work of one sort or another, it was sharply limited to certain sets of muscles, the rest of the body being entirely neglected, and the muscular system save for a few muscles remaining flabby and undeveloped. The heart not being called on for even ordinary demands remains as flabby as the other muscles. The reason for this lack of activity as given by the girls is that they are so fatigued by their limited work that they are totally unable to get up any interest in any general exercise after hours, either indoors or outdoors, and often are too fatigued even to eat properly, having no appetite. Furthermore, they are often of the opinion that any more exertion would be bad for them. Not a single girl in the series was symmetrically well developed, although some had certain sets of muscles in good condition. Any exercise outside their usual routine they avoided because it was difficult for them, and they thought it would produce more fatigue, if not actual harm. As a matter of fact, however, it has been demonstrated both in the laboratory and in everyday life, that the constant over-fatigue of the body due to the over-activity of certain muscles is lessened rather than increased by general exercise, for the fatigue toxins which have piled up in the body when limited motions are made are washed away by the free circula-

tion brought about by unrestricted motion. We have tried to show these girls first that by developing the whole body the sense of fatigue in the used muscles will be lessened, and that with the general development will come cardiac development, which means better circulation and less fatigue than any sort of muscle activity. Piece workers, paid by their activity, have demonstrated this time and time again by reporting increased working and earning power after they got into the habit of doing something beside rest the body in the evening. So instead of advising the tired girl to go home and rest, we have tried to induce her to take general exercise, preferably out of doors, and preferably in the form of sport, because of the conclusion we have come to that the cardiac muscle is sharing in the lack of development of the general musculature in most of these cases, and hence the whole health is impaired. We have generally advised a short rest first, and then carefully graduated exercise under the direct supervision of physical directors and with the doctors at hand to repeat the cardiac examination frequently, to see first that the girl is doing enough, and second that she is not doing too much, so that the heart will be developed and not be strained. Working up to the point of fatigue but not beyond it, we believe makes for the greatest health. Our aim is not to develop big muscles, but normal ones; not hypertrophied hearts, but normal ones.

Re-examinations have been made of a number of the girls. Of the ones who followed the advice given in regard to graduated general and special exercise and indoor and outdoor games of various kinds separately prescribed for each individual girl and taught her by physical directors who understood what the aim of the work was, each one is showing an improvement in heart action. There have been many girls who have done part of the prescribed work, 183 who have done everything advised, and reported frequently for re-examination and consultation. Some have been briefly examined every week after exercise, and the amount and the character of the prescribed work altered. It seems rather dangerous to turn these girls loose into a gymnasium to do as they like. They may be spurred by emulation to do too much, or they may receive no impetus to do anything, and then blame the gymnasium for either their lack of improvement

or their heart strain. We must show the girls what a gymnasium will do, and what exercise will do, by individually supervised work. If this is done, it will be found, as has been found in this series, that the heart will grow steadier gradually, will lose its tendency to tachycardia, and possibly also the murmur, although this is usually the last to disappear. Of the girls who still maintained they were too tired already to do any more exercise, or who were so little interested in their health that they preferred to sew or read in the evening, the hearts are found repeatedly in the same condition, even though the girls, feeling more and more tired, go from one position to another, trying to find lighter work, and also be it noted, even though they follow all other advice in regard to hygienic living.

The theory of weak but not diseased heart muscle, of flabby but not diseased valves, explains many cases of functional heart conditions not to be accounted for entirely on grounds of anemia. If we have a poor blood supply to the heart muscle, whether or not the blood is normal in content, the heart will of course show signs of it. If, in addition, we have a heart which never has any regular demands made upon it, we shall have the story in the most easily diagnosed functional conditions. In most of these cases the heart gives the impression of being in exactly the same condition as the voluntary muscles of the body after a week's illness in bed, performing its contractions in a tremulous, jerky way. The valves seem "weak-kneed."

The theory of under-development of the heart-muscle also accounts for the same cases which are sometimes put into the class of over-worked hearts, especially when found in working girls. It is my experience, however, that working girls are not the ones who overstrain the heart usually. We are much more likely to find strain in the high school and college girl who goes in for competitive athletics. The working girl, I believe, as a rule, makes too light demands on the heart, contrary to the common opinion; while the other type of girl makes too severe demands frequently. They develop a fine physique so rapidly that the heart is strained to keep up. The heart which would be normal for normal demands is sometimes inadequate for this over-activity. These cases can be differentiated so easily from the heart which is not up to normal even for ordinary work that

it is unfortunate it is not always done. Although the physical signs are often alike as regards murmurs, tachycardia, and irregularity, the heart sounds are much more vigorous, there is a history of greater general activity, and the musculature is found better developed, and the health more nearly perfect as a whole. The heart in these athletic girls often shows normal sounds when at rest, but after performing the given exercises, which are usually performed with much vigor, in contra-distinction to the languid manner in which they are performed by the undeveloped girl, the same signs appear as in the undeveloped heart. The heart condition seems to be due to the tendency of these vigorous girls to keep just a little bit ahead of their hearts in development. Unless they carry this to the extreme, their hearts ultimately settle down to a quite normal condition, but on account of the danger of this extreme and the resulting permanent damage they should be as carefully watched as the other type. These girls are usually over-active in spurts and starts. Their normal routine keeps them in good condition, but an occasional athletic spree takes a heart which would be otherwise normal, but one which has not quite settled down to its pace. They will often give a history of ordinary activity during the week, and on Saturday or Sunday a "hike" of five or six miles to a camp, an hour's hard swimming, half a dozen sets of tennis, a few games of basket ball, etc. Sometimes they keep this up more or less continuously, especially in the summer. It is very common to find a girl who can do all these things, who looks well and is well, never complaining of anything except a little shortness of breath, as a warning of trouble to come. Muscular activity should proceed hand in hand with, and parallel to heart development, being neither so little as to hold the heart back from normal growth in strength, or so much as to cause it to fall back from the normal. By normal I mean, of course, not any given findings in the heart itself, but a heart perfectly adequate to any demands within the individual's range, and showing no indication of becoming less so. And the individual's range should not mean the artificial one which many individuals establish for themselves. Although leading a quiet life, such as that of a stenographer, any girl may be called upon for considerable activity at any time, and her heart should not be consid-

ered normal if it will only stand the strain of stenography. Nor should it be considered normal if she has tried to develop her strength to that required for a piano mover at the expense of her heart. Probably heart strain is common on top of valvular or myocardial disease, but I believe it also common with the normal heart in young adults.

The importance of differentiating between the under worked and the over worked heart is quite obvious. Both kinds are found in each class of girl, the working girl and the college girl, but in the main I believe the former needs more activity and the latter less, or at any rate, a change in the variety of activity.

Weakness of the heart muscle due to lack of normal development is the real trouble in many hearts which might easily be confused with those showing organic disease. Out of this series of 800, of which not one belonged to the "heart invalid" class, it is reported that 442 had never had their hearts examined before, although many of them felt that they had heart trouble, or, strange to say, lung trouble,—the dyspnoea on exertion being often interpreted as lung weakness. Of the 358 who had been previously examined, 193 had been told by physicians that they had heart trouble, usually valvular, and had been advised to work as little as possible and rest all they could. Since few of them could do either of these things they were in a poor psychic condition, thinking that they were probably slowly killing themselves by unavoidable labor, and seeking every opportunity for idleness, often going from one job to another seeking a "soft" one. Their favorite recreation is the moving picture show, because there they can sit still. Many of them, even in the class most addicted to dancing, never dance. Even if the physician does not supplement his diagnosis of heart trouble or valvular trouble by advice to keep quiet and rest, he might as well do so after telling the girl the diagnosis, for the girl herself will not believe that anything but rest will keep her in health and save her life, or that activity will eventually help her. An under-developed condition of the myocardium, however, is something that a girl can be made to understand, and is something which she will try to improve. Out of a group of five of the most active physical directors it was recently found that each of the five had been told at one time or the other that she had valvular disease.

But these girls had each felt such a yearning for activity they had refused to consider the diagnosis of any importance in shaping their lives, and went on their way into athletics, none of them ever having heard from the valvular heart trouble. At the present time four of them show quite normal hearts, their trouble having been previously either mildly strained hearts which recovered their balance with the attainment of full growth, or slightly under-developed hearts. The other has now a well-compensated mitral lesion, which has undoubtedly done better on the regime the girl planned for herself according to her own feelings and desires than it would have on the regime of limited activity which is so often started upon the finding of a lesion. But these were exceptional girls in that they did not allow themselves to be restricted. The average girl does not yearn for activity very much, and not at all if she has any suspicion she is going to injure her health by it.

Too many diagnoses have placed the possibility of improvement forever beyond reach, rather than constructively embodying the cure in the diagnosis. It is certain that comparatively few cases of irregularity and tachycardia, and comparatively few murmurs in the whole series of 2,000 meant organic disease of the heart, and that far more were myocardial sub-development which can be brought up to normal by suitable bodily activity, strengthening the heart along with the other muscles. Ordinary factory work will not do it, nor will sitting reading and embroidery and crocheting, nor going to evening school or the movies. The process which must be gone through is the same in theory and almost the same in practice as that required to promote compensation in a diseased heart, with the difference that while in the latter case we get a heart artificially developed to be adequate to its ordinarily henceforth somewhat limited purposes, in the former case we produce a normal sound heart, good for anything in reason. Much is to be gained by considering as few hearts as possible in the category of "sick" hearts, and as many as possible in the category of under-developed hearts.

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FRENCH ORPHANAGE FUND.—The New England Branch of the French Orphanage Fund has announced that the fund has reached the amount of \$526,934.30.

## Clinical Department.

### ENLARGED THYMUS GLAND IN INFANCY AND ITS TREATMENT BY RADIUM.

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AND

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THE size of the thymus gland, in relation to the entire body, is greatest at birth, but the absolute weight of the gland steadily increases up to about the twelfth year, after which it undergoes gradual atrophy.

The chief clinical interest in the gland centers around its pathological enlargement during the first few years of life, particularly in infancy. Very little is known as to what constitutes the etiology of this pathological overgrowth, although the fact that it is often found enlarged in rickets, syphilis and certain chronic infections has led to the theory that its hyperplasia is an attempt to compensate for the lymphoid exhaustion of these diseases.

The symptoms of enlarged thymus may be divided into two classes: general and local. Under the former fall the results of faulty endocrine function, such as flabbiness of the tissues, lack of resistance to acute infection, liability to frequent convulsions, eczema, and mental retardation. Some infants never show these generalized disturbances but exhibit only the local symptoms which are referable entirely to the mechanical effect of the enlarged gland. From the fact that the thymus is situated in the upper part of a closed and rigid chest cavity, any gradual or sudden enlargement must of necessity produce pressure on the underlying vital structures. While it is universally admitted that this pressure may cause laryngeal spasm, heart shock, pulmonary engorgement, etc., it has been denied that a structure as soft as the thymus could press upon the trachea to the extent of causing obstruction. This contention seems to be faulty, however, for in one of our cases tracheoscopy showed an inward bulging to the extent of half the lumen at a point two inches below the vocal cords.

These local symptoms of thymic pressure are almost entirely respiratory in character and vary from a slight cough, coming on at intervals of a few days or weeks, to a dyspnoea of the most profound type. The cough is often croupy and paroxysmal, worse during feeding, and is out of proportion to the clinical findings in the throat or chest. During these attacks of cough there are often a few râles at the bases of the lungs, but whether this moisture is a mild exciting cause of the cough or whether it is a congestion due to obstruction of the pulmonary veins is not clear.

Accompanying the cough, or independent of it, there is usually present a certain amount of dyspnoea which is largely inspiratory in type and aggravated during feeding and in the course of acute illnesses. The respirations at these times are distinctly audible. If the dyspnoea is at all pronounced cyanosis is likewise present and may vary in degree from a transitory bluish tinge to the lips and nails to a constant extreme lividity. When the asphyxia reaches a certain point death ensues or generalized clonic convulsions appear which may terminate in either death or recovery. Not all cases of thymic death are due to obstructed respiration, however, for in a certain number of those occurring suddenly during anaesthesia and after fright there is very little dyspnoea. It is probable that in these instances pressure of the acutely congested gland causes reflex heart shock.

The diagnosis of enlarged thymus must be made both from the history and physical examination. If cough, stridor, or cyanosis is present in the history it is suggestive, but when the history is negative, examination alone must suffice.

Inspection often reveals a flabby, poorly muscled child with a bulging of the upper front chest. Some authors have described the gland as visible in the suprasternal notch during inspiration, but in only one of our cases were we able to duplicate their findings. Percussion generally gives an area of dullness extending either side of and continuous with the usual hyporesonance of the upper sternum. The dullness, as a rule, is more pronounced on the left, but unless very light percussion is employed the entire area will be obscured by the transmitted resonance of the underlying lung.



Often when dyspnoea and retraction are slight, they may be accentuated, or when absent may be produced, by gently extending the head over the edge of a pillow. This procedure, however, should never be resorted to in extreme cases for fear of sudden death.

The one diagnostic means which stands above all others and the only one which is infallible is the x-ray. By its use the contour of the gland may be seen normally projecting but little either side of the sternum, and continuous with the heart shadow:—compared often to the neck of a gourd extending up to the clavicles. Normally the sides of the shadow are concave, while the enlarged gland gives an outline the sides of which are both displaced laterally and bent convexly. The left lobe of the gland is usually enlarged more than the right, which corresponds with the percussion findings. Great care must be exercised in placing the child flat on the back during the exposure for otherwise the mediastinal structures will be projected obliquely, with a resulting worthless negative.

The treatment of enlarged thymus is simple and specific; it consists solely in radiotherapy. Although for over a decade the x-ray had been employed to decrease the size of the gland, the method did not come into general use until about four years ago. Even then the technique of treatment varied so in the hands of different workers that contradictory reports arose as to its efficacy. The matter was finally clearly defined in 1917 when Friedlander\* published a series of over a hundred cases in only four of which x-ray therapy was not successful. He attributed his good results partly to his standardized method of treatment, which consists in using a tube of known penetration, a constant target-skin distance, a filter of certain thickness, a definite length of exposure and repeated treatments.

Two years ago one of the writers (H.W.B.) was asked to see an infant who was in a desperate condition from thymic asthma. Roentgen ray treatment was advised and the case referred to the other writer (A.C.H.) who suggested that, owing to the extreme severity of the case, radium be substituted in the hope that its effect might be more prompt. Radium had produced such marvelous shrinkage of certain tumors of other structures that it seemed just

ifiable to apply it in this nearly moribund case, even though its use in this condition had never been reported in the literature. The results of this substitution were so satisfactory that ever since radium has been used exclusively in both hospital and private cases.

The technique of treatment is as follows: 100 milligrammes of radium element, still in its 0.3 millimeter silver capsule, is wrapped in sufficient gauze so that when strapped to the chest by a strip of adhesive, it will lie a half-inch from the skin surface. Four marks are made in the form of a rectangle over the thymic area and the nurse is instructed to allow the package of radium to remain two hours over each mark. This makes a total exposure of 800 milligramme-hours. From the moment a diagnosis of enlarged thymus is made the child's head should be kept in a flexed position, thus lessening the severity of the asthma and the possibility of sudden death.

Judged solely from the end-results, there is little choice between radium and x-ray. By both methods a cure is effected, provided the child survives the effects of thymic pressure until the radiotherapy has had opportunity to reduce the gland. Radium does have certain advantages over the roentgen ray which may be summarized as follows: The action of radium is more rapid; with radium one treatment alone suffices to effect a cure, even in the severest forms of the disease; radium is portable, thus obviating the difficulty of transporting the patient to a roentgen laboratory; the application of radium is simple, thus eliminating the dangerous element of fear from the mind of the patient, and at the same time rendering unnecessary the use of an elaborate x-ray equipment and highly skilled operator.



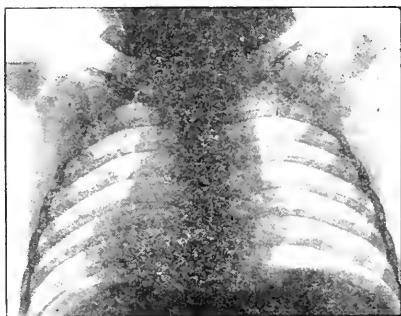
NORMAL THYMUS SHADOW.

\* Friedlander, A.: Enlargement of the Thymus Gland Treated by the Roentgen Ray, *Am. Jour. Dis. Child.*, Vol. xiv, p. 40, July, 1917.

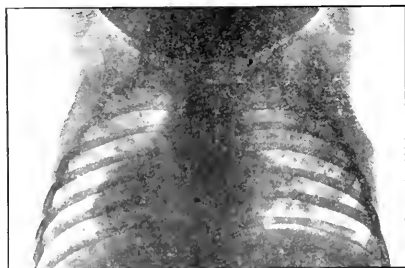
To date we have treated thirty-four cases of enlarged thymus with radium. In every instance there followed a prompt and lasting disappearance of all symptoms. Two of these patients died more than a month after treatment, one with influenza and the other from inexplicable convulsions.

Three illustrative cases follow:

1. Male, 14 months of age, with a history of eczema, weakness and convulsions from birth. On close questioning these convulsive seizures were found to consist of the following sequence of events: sudden asphyxia, cyanosis, retraction of the neck, general clonic contractions, syncope followed by exhaustion. Examination showed a flabby, eczematous child with bulging of the upper chest and well-defined thymic dullness. X-ray corroborated these findings. Radium was applied. The child had no more convulsions and one week later the skiagram showed a normal thymic area.



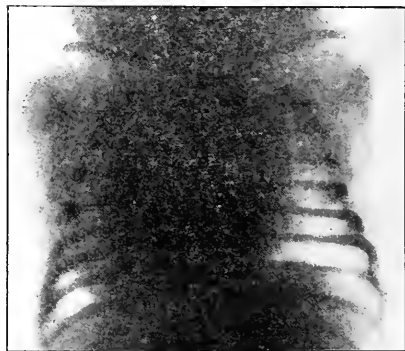
CASE 1.—Before treatment.



CASE 1. One week later.

2. A male infant, twelve pounds in weight, was seen one hour after birth. The labor had been easy but with the first cry the obstetrician had noticed that the child's breathing was de-

cidedly abnormal. The patient presented the most unusual appearance; the skin, lips, and nails were intensely cyanotic and the inspiratory stridor was distinctly audible in the adjoining room, while the epigastric retraction was equal to that accompanying the severest forms of laryngeal diphtheria. Percussion and x-ray both detected the presence of a thymus filling nearly one-half the chest cavity, while inspection, palpation, and x-ray all revealed the presence of an enormous thyroid occupying the entire front of the neck as far back as the lobes of the ears. Radium was applied and within 48 hours the baby showed decided improvement which continued until, at the end of a week, he was nearly normal in appearance. It was interesting to note that the thyroid disappeared coincidently with the shrinkage of the thymus. X-ray plates two and ten weeks after treatment showed a normal thymic outline. The child was still perfectly well fifteen months after discharge from the Hartford Hospital.



CASE 2.—Before treatment.



CASE 2.—Two weeks later.

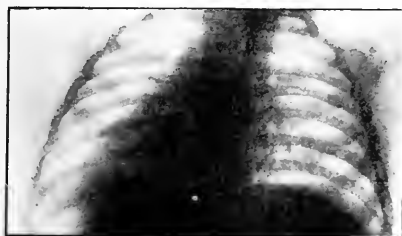


CASE 2.—Ten weeks after.

3. A female of 11 months who had always breathed "as though she had a cold." Frequent attacks of choking and cyanosis, particularly at time of feeding. X-ray confirmed the percussion findings of enlarged thymus. One week after treatment the child was perfectly well and the skiagram showed a normal thymic shadow.



CASE 3.—Before treatment.



CASE 3.—One week later.

The severer types of thymic enlargement, which are comparatively rare, are easy of diagnosis, but the milder forms of the disease, which go to make up the great majority, are

readily overlooked. The more one sees of this condition the more careful he is to look for it in each new patient. Every infant who has "queer spells," who has habitual attacks of coughing, choking, dyspnoea, or cyanosis, should have an x-ray of its chest in the hope of finding a condition which is so easily and satisfactorily cured.

## Medical Progress.

### REPORT ON DERMATOLOGY.

By JOHN T. BOWEN, M.D., BOSTON.

#### AFFECTIONS OF THE MUCOUS MEMBRANES.

Foerster<sup>1</sup> in his chairman's address in the section of dermatology of the Seventieth Annual Meeting of the American Medical Association, gives a very good résumé of the affections of the mucous membranes that are of especial importance from a dermatological standpoint. As he points out, this field has been comparatively little studied, although it presents abundant opportunity for observation and research.

In lichen planus the lesions may be entirely limited to the mucous membranes or may be present there for a long time before the appearance of skin lesions. According to one tabulation, in 26 instances out of 157 the mucous membrane lesions existed alone. Lichen planus may appear in addition to the oral cavity, on the vaginal and urethral mucous membranes, and on the glans penis. Lichen planus is often confounded with syphilis, and in doubtful cases the mucous membrane lesions may be of much aid. Lupus erythematosus also may be limited to the mucous membranes, either wholly, or sometimes as a precedent of its appearance on the skin. Its recognition is usually a matter of considerable difficulty, and it may, as well as lichen planus, be easily confounded with syphilis. Erythema multiforme and pemphigus may also occasionally be limited to the mucous membranes, and may simulate mucous patches.

Among other cutaneous conditions in which the mucous membranes may be affected may be mentioned dermatitis herpetiformis, urticaria, angioneurotic edema and purpura, as well as

certain drugs as iodine and antipyrine. Serious mucous membrane lesions accompany the severe form of bullous dermatitis following vaccination, and the acute pemphigus of butchers.

Geographic tongue, or wandering rash of the tongue, is described in most text books as a rare disease occurring chiefly in young children. Foerster has met with it most often in adults and more commonly than is generally believed. At a base hospital several instances were found in soldiers who were thought to have syphilis. The yellowish or yellowish-gray color of the slightly elevated border, contrasting sharply with the red center is a characteristic feature. Moeller's glossitis, or chronic superficial excoriation of the tongue is a rare condition, occurring in middle-aged adults, principally women, affecting principally the tip and edges, but also the dorsum of the tongue, characterized by the presence of intensely red sharply defined, irregular patches, in which the filiform papillae are thinned or absent, the fungiform papillae are swollen, and the stratum corneum desquamated. There is severe pain caused by eating.

Vincent's disease is regarded by Foerster as an important factor in the differential diagnosis of lesions of the mouth, with the return of the troops to their own communities. There seems to have been an increase of this affection in Canada and England, since 1915. It has been widespread, though not common in this country for many years, and sometimes small epidemics have occurred. "Trench mouth" among the overseas troops has been identified with Vincent's disease, which is communicable and curable. It may appear as a deep ulceration of the tonsil, on the lower jaw posterior to the last molar tooth, or as a general mouth infection. Mild types may develop into severe attacks with the formation of sloughing, serpiginous ulcers, either superficial, or deep and destructive. The disease may also produce ulceration and gangrene of the vulva, conjunctivitis or an ulcerated balanitis. It is caused by the spirillum of Vincent and the associated fusiform bacillus, organisms which can be readily seen in dark-field preparations. It may be confounded with diphtheria or syphilis. With regard to the latter the possibility of confusing the two affections is not so remote as might appear, as Vincent's disease may show lesions strongly resembling mucous patches, and the organisms should always be searched for.

#### THE ETIOLOGY OF COMMON WARTS.

Wile and Kingery<sup>2</sup> of Ann Arbor undertook during the past year an experimental study in the attempt to produce localized hyperkeratoses by the injection of a filtrate of wart material, starting with the conviction that warts were caused by filtrable virus. Theories as to the causation of warts have been: that they were due to an infecting organism, to trauma, or to a foreign body. Many clinical features favor each of these suppositions. The fact that they do often occur at points of trauma, especially on the hands and feet, points to a traumatic etiology. In favor of a foreign body are the numerous examples of localized hyperkeratosis following accidental lesions from bits of glass and steel, thorns, etc. With regard to the activity of an infectious agent, the appearance of satellites following large warts, the appearance of warts on contiguous and opposing surfaces, and the occurrence of small groups of individual warts, lend weight to this hypothesis. Numerous instances have occurred of the appearance of warts about or under the nails, after scratching or removing lesions of the same nature in other situations. Experiments by Jadassohn in 1894, in which he implanted small bits of wart tissue under the epidermis, gave positive results in 31 out of 74 inoculations. The period of incubation varied from seven weeks to three months, and all the lesions disappeared spontaneously. The writers' experiments were characterized by the intrautaneous injection of the filtrated virus of common warts into the skin of their own hands and those of their assistants. Wile and Kingery's conclusions are: (1) The sterile filtrate of wart material injected intrautaneously is capable of producing localized hyperkeratoses which are clinically and pathologically identical with verruca vulgaris. (2) The initial experimental lesion starts as a flat wart which in no way differs from that seen in verruca plana. (3) Interpapillary hypertrophy, inflammation, and marked hyperkeratosis, they believe, occur as secondary traumatic manifestations and they agree with Unna that the initial change consists of an acanthosis and flattening of the papillae. (4) Without denying that it is still possible that localized hyperkeratosis resembling verrucae may be due to traumas or foreign bodies, it is definitely demonstrated that such changes can be caused by a filtrable virus. It is not unlikely that when trauma and for-

eign bodies apparently are present as inciting factors, they may merely represent the point of entrance of an infectious agent such as has been determined in these experiments.

#### CLINICAL STUDIES IN CUTANEOUS ASPECTS OF TUBERCULOSIS.

Stokes<sup>3</sup> in a long and elaborate paper contributed to the *American Journal of the Medical Sciences*, deals in the first portion of his article with:

1. "Tuberculous" purpura, erythema multiforme and erythema nodosum. He states that his interest in the relation of this group of dermatoses to tuberculosis was excited by the death of a patient from miliary tuberculosis, who had previously had an attack of purpura rheumatica and erythema multiforme. The material for his deductions was presented by a series of about 40 cases of erythema nodosum, erythema multiforme with purpura, erythema induratum, and various types of papulonecrotic tuberculids seen in the dermatological section of the Mayo clinic during 1916-1917. Stokes reports 10 selected cases in detail from which he draws the conclusion that while positive assertion is impossible at the present time, there is much clinical and experimental evidence tending to show a close relationship between a tuberculous infection and the above named dermatoses. It cannot be stated as yet whether the lesions themselves are due to the tubercle bacillus or whether their appearance is the result of a lighting up of a tuberculous focus by some other agency. In any event he thinks that every case of purpura and many cases of erythema multiforme should be studied with a view to the possibility of tuberculous infection, as well as all cases of erythema nodosum. The results of a thorough examination have shown, in the writer's opinion, so high a percentage of demonstrable and suspected tuberculosis, pulmonary and glandular, osseous and cutaneous, that we are warranted in considering the association as more than a coincidence. There is also ground for thinking that erythema nodosum especially may be sometimes of diphtheroid or streptococcal origin as well as of tuberculous.

2. The diagnostic and clinical relations of certain tuberculids. The writer's material consisted of 30 cases of the so-called papulonecrotic tuberculid, or erythema induratum and of associated conditions which are generally consid-

ered to represent the response of a hypersensitized skin to emboli of tubercle bacilli from a tuberculous focus elsewhere in the body. In these cases an association with tuberculosis was shown by the family history in one-fourth of the cases, incontestable objective evidence in more than half (57%), and presumptive signs of the disease in 70%. One-third of the patients had radiographic signs of pulmonary tuberculosis; an equal number had suggestive or positive physical signs of lung involvement. Two-thirds of them had a tuberculous lymphadenitis. He found a slight initial fever and loss of weight in 40%, amenorrhea in 43% of the women, moderate leukopenia and sometimes anemia. There were often rheumatic symptoms at the outset, or in the course. Coughs, sweats, and other usual signs of tuberculosis were wanting, but there was often a septic focus and collateral types of infections, such as tonsillitis, rheumatism, and pneumonia. No direct relationship of the tuberculid to the clinical condition of the tonsils could be determined, but 50 per cent. of the patients had extremely septic tonsils. The teeth showed septic foci in a limited number of cases.

Removal of the tonsils in seven cases failed to prevent the outbreak of a tuberculid or to modify its course, while complete extirpation of all recognizable septic foci in two cases, without removing or treating the tuberculous focus, was without result. He thinks it conceivable that the effect of a secondary septic focus, while not direct, is predisposing, in that toxins or even bacteria emanating from it may be in part responsible for the cutaneous allergy which is assumed in explaining the pathogenesis of the papulonecrotic tuberculid.

3. The therapeutic management of the tuberculids, with special reference to the efficiency of arsphenamine. In 20 cases of various types of papulonecrotic tuberculid and erythema induratum, arsphenamine (Ehrlich 606) was used with good effect in combination with a systemic régime and roentgen therapy. Of these cases over one-half had demonstrable tuberculosis, usually in the form of a lymphadenitis, and in nine cases surgical treatment of the latter condition did not affect the tuberculid. The writer concludes from his observations that the appearance or persistence of a cutaneous tuberculid following reasonably complete surgery is an indication for a discontinuance of

surgical treatment of the tuberculous focus, and the adoption of a medical means of fortifying the patient by hygienic and roentgen ray. He found that arsphenamine showed good results in selected cases of obscure tuberculosis, as when there is a tubercle without a demonstrable focus, but that it was not indicated in febrile acute or rapidly progressive cases. It often had a striking effect on the tuberculids. In 53% of his cases the lesions were completely removed. It also had a marked constitutional effect in these cases, shown by a gain in weight and the disappearance of rheumatic symptoms. The effect of arsphenamine on the tuberculous adenitis was not marked. As regards the roentgen ray, it helped to reduce the glands, but otherwise had no such effects as arsphenamine. He considers an outdoor life, correct hygiene and diet, and the removal of all secondary foci of pyogenic infections of tonsils, teeth, etc., important adjuncts.

#### THE VACCINE TREATMENT OF SKIN AFFECTIONS.

In the *British Journal of Dermatology and Syphilis* for April-June, 1919, there appear several papers by English writers on the vaccine treatment of skin affections. Adamson, stating that it is fifteen years since Wright described his method of stimulating the body to produce protective substances, and predicted that in the future all microbial affections would be dealt with by increasing the resistance of the patient by means of vaccine rather than by attempting to kill the microorganism by means of antiseptics, asserts that in recent years the vogue of vaccine treatment has somewhat waned, and that owing to disappointment in this direction more attention has been directed to chemio-therapeutics, or direct attempts to kill the microbes by drugs. While the value of preventive vaccination has long been firmly established, the efficacy of vaccination as a curative agent is still open to doubt. Adamson's own experience in the treatment of sycosis, pustular acne, and of other chronic staphylococcal infections by vaccines has been distinctly disappointing, and he is unable to record a single case of this sort that has been definitely benefited by the treatment. In this category he includes chronic furunculosis; in recent cases of furunculosis the results have been somewhat more encouraging. In many of these more acute cases cures have resulted apparently from vac-

cine treatment, although even here it is difficult to lay down any rules as to dosage, and to know beforehand whether vaccines are or are not likely to do good. Adamson has altogether failed in the treatment of lupus vulgaris, in fact there has seemed to result a more rapid spread of the disease. He concludes that while it may be admitted that strikingly good results do sometimes occur as the result of vaccine treatment, we have no means of knowing in what doses to employ it in any particular case, and no sound explanation for its action, nor do we know why in the majority of cases it fails to effect a cure, and only occasionally gives satisfactory results.

Whittfield, who has been a more or less enthusiastic advocate of vaccine treatment, alludes at the outset to the wide divergence in the views of experienced observers on this subject. He asserts, however, that all will agree to the general proposition that some cases have been so favorably influenced by the inoculation treatment that this favorable influence cannot be dismissed as mere coincidence; and secondly that while only a few cases are definitely aggravated by the treatment, many seem to have been entirely unaltered. He still asserts his faith in vaccine treatment for furunculosis, "when the attack of furunculosis is general and not local in distribution, when there is no evident exposure to sources of cutaneous irritation and no obvious defect of health." A majority of the cases he has seen fall into this class. With regard to an old well-established staphylococcal sycosis, he has in no instance succeeded in curing it by the vaccine treatment.

Sequeira and Western of the London Hospital adopt an intermediate position between the optimists and pessimists. Striking successes have been attained in the treatment of the deep-seated furuncle and carbuncle. They were less fortunate in staphylococcal folliculitis, of which they had seen a large number of cases in soldiers, especially the extensive cases affecting the thighs and legs and buttocks, which have proved highly intractable to all other methods of treatment. They have also failed in sycosis of the beard, and seek the reason in the fact that the lesions are not sufficiently in contact with the body fluids, or in the development of fibrous tissue. A suitable streptococcus vaccine has been found of value in certain cases of erysipelas. They found that the dry type of lupus

vulgaris does not respond to vaccine treatment, as has been the experience of Reyn of Copenhagen. On the other hand, scrofuloderma and ulcerated lupus have been more amenable to the vaccine treatment. No good results were obtained in the case of the tuberculides—sometimes bad results. The treatment of aene vulgaris by vaccines they found frequently disappointing, although they believe that in this disease vaccines are more often employed than in any other skin affection. In pustular aene success is occasionally met with, but even here are many failures. Aene rosacea they regard as dependent upon internal causes and not therefore suited to vaccine treatment.

MacLeod and Topley of Charing Cross Hospital have given vaccines a fairly extensive trial in skin diseases during the last ten years. This was done by coöperation of the skin with the bacteriological department. Of all the staphylococci conditions that they treated with vaccines the only ones in which they have been followed by definite and immediate benefit have been staphylococcal lesions, especially acute, recent and recurrent boils. By vaccines, both stock and autogenous, they were able to cause the rapid involution of boils without the assistance of any form of local treatment, and in almost every case to keep the patient free from recurrences, although there was often a tendency to relapse after cessation of the vaccine treatment. In the case of chronic boils, especially those about the back of the neck, the results were more uncertain and sometimes unsatisfactory, due perhaps to the fact that the acute boils are better supplied with blood, and the protective substances called forth by the vaccines have comparatively free access to the affected tissue. With regard to streptococci infections, their results in aene were on the whole unsatisfactory. Where suppurating lesions predominated, some impression was made on the suppuration, but little, however, on the comedones. When the vaccines were discontinued an exacerbation of the pustulation usually occurred,—indeed some of the worst cases of aene were those where vaccines had been employed. They consider that vaccine should be resorted to only under special conditions in aene, and form no substitute for other methods. In sycois of the beard the vaccines were uncertain and disappointing and not to be compared with the x-rays in efficacy. In tubercu-

losis of the skin, improvement was obtained from Koch's original tuberculin in lupus in which superficially ulcerated patches were present, and they have seen healing taking place on the subsidence of the local reaction; but they regard this procedure as dangerous, for fear of stirring up foci in the internal organs. It appears to them that the rôle of tuberculin in cutaneous tuberculosis should be an entirely subsidiary one. They believe that the employment of vaccines has been associated with a not inconsiderable amount of scientific quackery, and that they have been used promiscuously in diseases in which it was unreasonable to expect they would be of benefit. On the whole in their experience the only affection in which they are of appreciable benefit is acute boils.

#### TREATMENT OF ERYSIPELAS.

So many different local applications have been introduced and praised in the treatment of erysipelas, that the affection has come to be regarded as among those that prove their resistance to all medication by the number of the proposed methods of cure. Guy<sup>1</sup> of Pittsburgh reports 80 cases of this affection admitted to the hospital in the dermatological department at Camp Travis, Texas, and various methods of treatment, both general and local, tried for the sake of comparison. Owing to the fact that erysipelas is a self-limited disease, running a variable course, that the average mortality is low, and that the patients treated were hardened by military training and an outdoor life, the writer is inclined, very properly, to offer only tentative conclusions. Of the 80 cases treated, 67 were of the usual facial type, and in eight of these there were small nasal ulcerations. In a number of the other cases a fracture of the skin from some injury or lesion could be verified as a starting point. The following local applications were used from time to time: Ichthyol in ointment, 10, 20, and 30%, 50% aqueous solution of ichthyol, boric acid plain and with the addition of small amounts of menthol and phenol, collodion, tincture of iodine, both pure and diluted, sulphate of magnesium in iced aqueous solution, pure phenol, and iced aqueous solution of boric acid. In several cases no local treatment was given, and the writer is inclined to the belief that local applications have little value in limiting the spread of the infection. If doubts

the value of ichthyol, which has the disadvantage of being messy, and thinks boric acid with menthol and phenol cleaner and more comfortable, and the same is true of phenol. Feed saturated aqueous solutions of magnesium sulphate or boric acid applied on strips of gauze afforded more relief than any other application, and he considers boric acid the better of the two. This is kept at the bedside and the applications changed as soon as they become warm. In all cases a polyvalent antistreptococcal serum was used, and he estimates that 75% of the cases were favorably influenced by it, as an improvement was too closely connected with the use of the serum to be explained in any other way. In most of the cases there was a fall in temperature, pulse rate and respiration, following the administration of the serum, and this was in turn followed in the course of a few hours by a slowly mounting temperature, which did not, however, reach its former height. The course of the disease was, in many cases, probably shortened and in most cases certainly modified in severity. In 25% of the cases the serum seemed to have absolutely no effect. The earlier the serum was given, the more certain was prompt relief. The intravenous method was in the end preferred as being almost painless and giving quicker clinical response.

## REFERENCES.

- <sup>1</sup> Journal American Medical Association, Aug. 30, 1919.  
<sup>2</sup> Journal American Medical Association, Sept. 27, 1919.  
<sup>3</sup> American Journal of Medical Sciences, February, March, April, 1919.  
<sup>4</sup> Journal of Cutaneous Diseases, June, 1919.

### Book Reviews.

*The Pathology of the Pneumonia in the United States Army Camps During the Winter of 1917-18.* By WILLIAM G. MACCULLUM, M.D. New York: The Rockefeller Institute for Medical Research. 1919.

The Surgeon General of the United States Army has sent out two commissions for the investigation of the epidemics of pneumonia among the army cantonnments. In Monograph No. 10 of the Rockefeller Institute for Medical Research, William G. MacCullum, M.D., has reported the pathological findings of pneumonia in the United States Army Camps during the winter of 1917-1918. He introduces the subject by giving a brief historical survey of the disease since the 16th century, mentioning epi-

demics which have spread over Italy, Switzerland, all Western Europe, North America, and Canada in the seventeenth, eighteenth, and nineteenth centuries. The conditions existing in the recent epidemic have, of course, been difficult because of the bringing together of large numbers of men of ages from twenty-one to thirty-one years of age from all conditions of life. It has been noticed that measles, particularly in the South, have been prevalent, and have often resulted in a peculiar form of pneumonia caused by a hemolytic streptococcus. This condition has been found, also, in men recovering from scarlet fever or some other disease, and frequently among those who had suffered no predisposing disease. In this work, two main types of pulmonary lesions—(1) interstitial bronchopneumonia, and (2) lobular pneumonia—are carefully described and illustrated by case histories. Notes have also been added on the importance of the late epidemic of influenza in the incidence of pneumonia. The material in this volume, illustrated by fifty-three excellent plates, some of which are colored, is a contribution of inestimable value to the pathological study of pneumonia.

*The Use of Blood Agar for the Study of Streptococci.* (Monograph No. 9.) By JAMES HOWARD BROWN. New York: The Rockefeller Institute for Medical Research. 1919.

Monograph No. 9, published by the Rockefeller Institute for Medical Research, presents the methods of investigation and the results of the work of James Howard Brown on *The Use of Blood Agar for the Study of Streptococci*. The alpha and beta types of appearance produced by streptococci in blood agar and, in addition, the alpha prime and gamma types which have never been described heretofore as such, are described and illustrated by plates, and various representatives of each type are considered.

The influence of the amount of blood and of agar used, and the influence of the age, kind of blood, and composition of the agar employed are some of the problems which are considered in this volume. The author presents his theories as to the causes of the various appearances. In the appendix are offered suggestions for preserving the genealogy of bacterial cultures and for making photographic records of growth. A tabular description of the principal strains referred to in the book, a tabulation of streptococci with reference to type of appearance in blood agar and fermentation reactions, and a tabular review of literature on streptococci and streptococcal infections, present these subjects in the clearest and the most accessible form.



*Transactions of the American Surgical Association.* Volume 36. Edited by JOHN F. BIXNIE, M.D. Philadelphia: William J. Derinan. 1918.

This volume of Transactions contains the papers read before the American Surgical Association at a meeting held on June 6, 7, and 8, 1918. Among the articles of especial interest may be mentioned an address by the president, Thomas W. Huntington, M.D., discussing the problem of industrial medicine and health insurance. The author believes that although this subject is one which at the present time is engaging the attention of many whose chief interest is the betterment of humanity, yet legalized, socialized medicine is a reform not to be advocated without due consideration and analysis of its possible issues.

"The Application of the Teachings of War Surgery to Civil Hospital Conditions" is considered by Major John A. Hartwell and Captain Ethan F. Butler, who expressed their belief that one of the greatest practical benefits derived from the war is the responsibility which has been assumed by laboratory workers in applying their knowledge to chemical problems, thus resulting in a closer coöperation with surgeons. In the progress which this support throughout the war has made possible in the knowledge of the pathology, bacteriology, and treatment of traumata, infections, and suppurations, the treatment which will now be possible in civil hospitals will be definitely advanced. Another article dealing with war conditions, by Daniel Fiske Jones, discusses the part played by the evacuation hospitals in the care of the wounded.

Other papers particularly worthy of mention include an article by John Bapst Blake on "Recurrent Dislocation of the Lower Jaw." The author believes that this is a condition which should be treated by operation, and the method by which the coronoid process or the insertion of the temporal muscle into it should be tied up to the anterior part of the zygomatic arch is explained. The author believes this to be less difficult than the attack on the temporo-maxillary joint, and predicts one hundred per cent. success for the operation in the future.

In a paper by William B. Coley and J. P. Hoguet are considered over eighty-five hundred cases of hernia treated by radical operation during the period from 1891 to 1918. They describe methods of operating and cite statistics which indicate that it is possible to cure ninety-five to ninety-seven per cent. of the cases of small reducible hernia in young adults. Another paper, by G. W. W. Brewster, reports

nineteen operations in which the right colon was excised. "The Treatment of Malignant Peritonitis of Ovarian Origin," by E. A. Codman, presents the histories, with a description of the operations, complications, and results, of five cases which terminated successfully.

In addition to these papers, this volume of the Transactions offers for the consideration of the profession many other articles worthy of the standing of the American Surgical Association.

*An Outline of Genito-Urinary Surgery.* By GEORGE GILBERT SMITH, M.D., F.A.C.S., Genito-urinary Surgeon to Out-patients, Massachusetts General Hospital; Assistant Visiting Surgeon, Collis P. Huntington Memorial Hospital; Captain Medical Corps, U. S. A.; Fellow, American College of Surgeons and of the American Urological Association. Authority to publish granted by the Surgeon-General, U. S. A. Illustrations by H. F. Aitken. Philadelphia and London: W. B. Saunders Company, 1919.

A few years ago it was the fashion to write little books called "Quiz Compendis" on every conceivable subject for the use of medical students and young physicians. These compendis represented very much what a book of carefully written notes taken by a good lecture student in some college course represented. They were skeletons of facts necessary to give a proper idea of the existing knowledge of the subject under consideration. Later came an era of books on "Case-teaching" which were very popular and very useful. The present book is a combination of these two, with something better than either. It contains in its less than 300 pages the essential facts of modern, up-to-date genito-urinary surgery for the student or practitioner of medicine, giving him an intelligent perspective of this large subject but leaving the details of major conditions and operations for large and more important books. Its author is modest enough to call the book an "outline" but it is better and more important than what that term suggests to the reviewer's mind. The publishers have produced the book with all the care and generosity usually reserved for larger works and the illustrations are excellent and adequate.

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## MEDICAL AND SURGICAL SERVICE OF THE UNITED STATES NAVY.

THE work accomplished by the Bureau of Medicine and Surgery of the United States Navy during the war has been carried out with remarkable foresight and adaptability, and with a spirit of resourcefulness and enterprise which merits the gratitude and appreciation of the people of this country. The health of the Navy and of the several million men of the Army committed to its care while under its protection on the seas has been well guarded by the intelligence, energy, and fidelity of the Navy medical personnel, whose achievement has been summarized in the report of the Surgeon-General, United States Navy, for the fiscal year 1919, including statistics covering the calendar year 1918.

Until the signing of the armistice on November 11, 1918, the medical division was concerned chiefly in maintaining a war comple-

ment, its distribution and replacement; since that time, it has been engaged in demobilization, a task no less difficult in a number of respects than the problem of expansion at the beginning of the war. At the beginning of the year, the commissioned personnel numbered approximately three thousand, including the regular officers, temporary officers of the Navy, and officers of the Naval Reserve Force. The professional work of the Naval Reserve Force and the spirit of patriotism which prompted these officers to give up their civilian practices was proof of the nobility and efficiency of our medical profession. The transport service was increased from thirty-eight vessels to about one hundred and twenty-nine vessels, each equipped with a medical department adequate to meet exceptional demands. The Navy transported from Europe 111,522 of the Army, Navy, and Marine Corps as sick and wounded. The fact that at the present time there are three hundred and one vacancies in the medical corps of the Regular Establishment, filled for the time being by men holding temporary appointments, has led the department to recommend that Congress be asked to provide means whereby officers holding temporary commissions may enter the permanent corps. During the year, nurses for the first time have been assigned to ships in their professional capacity,—a policy which has been proved by official reports to have been a valuable one. A total number of 11,125 hospital corpsmen have served during the war and have enjoyed the respect and confidence of the entire navy personnel.

In the transportation of army contingents, navy medical officers and hospital corpsmen worked night and day, heedless of personal discomforts and fatigue, effecting a number of general improvements in the sanitation of navy troop ships. During the months of September and October, 1918, the case-fatality rate was 6.43 for passengers and 1.5 for crews, the difference being due in all probability to the crowding of troop spaces. Particularly difficult was the medical service during the influenza epidemic: out of 129,364 troops transported, 11,385 contracted influenza, 1,040 contracted pneumonia, and 733 died. On many transports, especially during the epidemic of influenza, a naval medical officer would stand at the gangway as troops filed aboard to watch for the flushed or markedly pale face, and the manner which suggested sickness. Suspicious cases were

examined and if there were any confirmatory evidences of disease, those men were put ashore. During the voyage, formal daily inspection of the troop spaces were made, and a sick bay was reserved for serious cases. The problem of returning the sick and wounded to America arose early during the war. The resources available were utterly inadequate for the transportation of approximately five thousand casualties per month. In addition to the available hospital ships, therefore, it was necessary to make arrangements whereby all navy transports could carry back, on the westward passage, as many sick and wounded as possible.

In addition to the medical and surgical work of the navy medical department, considerable work has been done by psychiatrists detailed to special duty at various training camps and stations. Their object has been to eliminate from the service men incapable of conforming to military requirements because of congenital or acquired defects of the brain and nervous system, and to educate both the lay and medical personnel to appreciate the frequency with which mental and physical defects underly irregularities of conduct. The fact that only eighty-seven out of a group of five thousand recruits enlisted during the war period were mentally or nervously defective indicates that the work of the medical examiners was well done.

In the construction of emergency hospitals, the principal work during the fiscal year 1919 consisted in completing the work begun the year before. Twenty-five bases of entirely different size and requirements were furnished with an aggregate of five hundred buildings to accommodate fifteen thousand patients and the necessary attendant personnel. Approximately eighty per cent. of the buildings were of one-story wooden construction, serviceable and durable. At some of the larger stations, the buildings were two stories high and of stuccoed terra cotta. All training camps were provided with dispensary facilities and at least temporary accommodation preliminary to evacuation to regular hospital establishments. Portable buildings were used at some of the stations for most overseas service. Medical supplies have been issued in greater quantities since the signing of the armistice than before, due largely to the many vessels placed in commission since that time. There were recorded

in the fleet for the year 1918 the following cases of contagious or infectious disease: Measles, 305; German measles, 152; mumps, 2,506; cerebro-spinal fever, 41; scarlet fever, 136; diphtheria, 241. In 1918, there were 9,307 deaths; of these 5,938 were due to disease, 1,158 to accidents and injuries, and 2,211 to casualties in action. The death rate for disease only was 11.78 per 1,000. Of the deaths from disease 5,027 were due to pneumonia. During the influenza epidemic, experiments were carried on in Boston and San Francisco to determine modes of transmission of the disease. None of these experiments, however, although performed with the utmost care upon a large number of individuals, furnished any conclusive evidence. The health of the Navy was safeguarded as thoroughly as possible during the epidemic by the use of all the preventive measures from which good effects have been elained. There were 2,398 cases of tuberculosis with 131 deaths, with a death rate, including all forms, of 26 per 100,000. Considerable progress has been made during the year in the control of venereal diseases.

This report of the Surgeon-General outlines the scope of the work of the Bureau of Medicine and Surgery of the Navy Department, presenting detailed description and statistics of hospitals at home and abroad, and of individual ships and stations, and tabular records of diseases, injuries, operations, and deaths. The report indicates clearly the excellence of the professional service,—the versatility, ability, and the spirit of personal sacrifice,—rendered by the navy medical department.

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#### PHYSICIANS IN ENGLISH FICTION.

THE recently celebrated centenary of George Eliot's birth calls to mind the chief character in one of her most widely read books—Dr. Lydgate, in "Middlemarch." In a consideration of the subject of medical men pictured in English fiction, this masterly study stands today unrivalled as an accurate portrayal of the trials, ambitions, and disappointments of a scientific physician of the times.

In every page of this work concerning the physician, the master mind stands revealed. One feels, in perusing its pages, that the author must have been a medical man, for no other could write of, and describe the occurrences and

events pertaining to medical practice in such a natural and graphic way.

To those who have laid aside their "Middle-march" for some years, or unluckily have missed its pleasures, a perusal of this wonderful book cannot fail to be of interest at the present time. It doubtless will call to mind instances of modern Lydgates, men of fine attainments, who through present day stress have been obliged to give up their cherished ambitions and seek medical work of a less congenial character, to meet the exigencies and imperative demands of the modern struggle for existence.

W. P. C.

### CLASSIFICATION OF DISEASES.

THE attention of physicians is called to the publication of "Classification of Diseases," the fourth edition of which, revised and enlarged, has appeared recently. This book represents the valuable work of a committee of physicians from the four large hospitals of the city. It has been adopted by the Massachusetts General Hospital, the Boston City Hospital, Carney Hospital, Peter Bent Brigham Hospital, and others. The fourth edition has been simplified to a considerable extent, especially by the arrangement of diseases in a given section or subdivision in strictly alphabetical order, thus eliminating the necessity for the "serial number" previously used. In this edition, the classification number consists of the combination of Section Number and International Classification Number. Two new sections have been added: Diseases of the Breast (male and female), and Anaphylaxis.

In the preparation of this classification, each of the forty-one sections has been assigned to a subcommittee of experts; so that the work, representing the decisions of a group of selected physicians, is a valuable contribution to pathologic systematology.

### MEDICAL NOTES.

RED CROSS SANITARIUM FOR TUBERCULOUS ITALIANS.—In commemoration of the construction of a sanitarium containing twelve hundred beds for tuberculous soldiers, with contributions from the American Red Cross and Italian war relief funds, marble tablets were unveiled

recently in Rome. General Albricci, Minister of War, represented the Italian Government, and H. Nelson Gay of Boston represented America.

LAVAL UNIVERSITY MEDICAL DEPARTMENT.—A fire which occurred on November 22 in the main buildings of the University of Montreal, known as Laval University, containing the medical department, resulted in a loss estimated at \$400,000.

MEDICAL SCHOOL OF VANDERBILT UNIVERSITY.—The sum of four million dollars has been appropriated by the General Education Board of New York for the purpose of enabling the Vanderbilt University to reorganize its medical school in accordance with the standards of modern medical education, and a new school of medicine will be established in Nashville as an integral department of Vanderbilt. It is probable that future development thus made possible will include the completion of the present Galloway Memorial Hospital, with enlarged equipment for public patients, the erection of an additional hospital unit, the organization of a modern laboratory building, and the appointment of an increased number of professors who shall give their entire time to the school and hospital in both laboratory and clinical branches. This appropriation has been made from the general funds of the Board and not from Mr. Rockefeller's recent donation of twenty million dollars.

CONTROL OF YELLOW FEVER AND HOOKWORM.—The annual report of the International Health Board of the Rockefeller Foundation has reviewed the activities of this organization during the year in the control and prevention of disease. Of particular interest is the following report of the work carried on in the control of yellow fever and hookworm:

"Arrangements were completed in June, 1918, to undertake at Guayaquil, Ecuador, a study of yellow fever infection and related infections which are frequently confused with yellow fever. The diagnosis of this fever has been extremely difficult. There have been no definite symptoms nor group of symptoms nor laboratory tests that could be accepted as conclusive. Even the findings of competent commissions have not in all cases sufficed to dispel the last honest doubt. It seemed advisable, therefore, before undertaking control measure

on a large scale, to subject these baffling infections to careful laboratory study with a view to contributing, if possible, to the true etiology of yellow fever. Guayaquil seemed to offer the material and the Government of Ecuador welcomed the proposal.

"The investigation was entrusted to a commission composed of Dr. Arthur I. Kendall, dean of Northwestern University Medical School, chairman; Dr. Hideyo Noguchi, of the Rockefeller Institute for Medical Research; Dr. Mario G. Lebrede of Cuba, Dr. Charles A. Elliott and Herman L. Redenbaugh. The commission, provided with laboratory equipment, arrived in Guayaquil, Aug. 2 and was given every facility for the conduct of its investigations.

"Dr. Noguchi succeeded in isolating an organism to which he has given the name of *leptospira ieteroides*, which is the apparent cause of yellow fever. At the end of 1918 much work was still required to demonstrate that the true etiologic agent had been discovered, but the prospect for success is most encouraging. If the germ of yellow fever has been discovered it will still further simplify the problem of eradicating the seed-beds of yellow fever; and upon the successful completion of that task the disease should disappear from the earth.

"During the year, work for the relief and control of hookworm disease was conducted in coöperation with the following states and countries: Alabama, Arkansas, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, South Carolina, Tennessee, Texas, Virginia, Ceylon, China, Fiji, Seychelles, Siam, Queensland (Australia), British Guiana, St. Lucia, St. Vincent, Trinidad, Costa Rica, Guatemala, Nicaragua, Panama, Salvador, and in the federal district Sao Paulo and Rio de Janeiro (Brazil).

In addition, hookworm infection surveys were completed in Jamaica, Guam, and the State of Sao Paulo, and another was begun but not completed by the end of the year in the State of Minas Geraes, Brazil.

"The examinations for hookworm disease made among United States soldiers confirmed in a striking way the board's experience of the past few years, and demonstrated that even light hookworm infections are of great importance. Many fullgrown soldiers who harbored the disease had the mentality of persons only 12 years of age. The mentality of 10,000 white men at Camp Travis who harbored the disease was about 33 per cent. below normal. Negroes were infected quite as frequently as whites, but they appeared to be relatively immune to the serious effects of the disease and did not show the same predisposition to other diseases of the same reduction in mentality."

The increased financial participation of official health agencies in demonstrations for the control of hookworm disease is one of the most significant developments of the year's work, for it indicates that in general, people are beginning to realize their responsibility for the health of the community.

COMMITTEE ON FOOD AND NUTRITION PROBLEMS FORMED BY THE NATIONAL RESEARCH COUNCIL.—The National Research Council has formed a special committee on Food and Nutrition Problems, composed of a group of the most eminent physiological chemists and nutrition experts in the country. The members are: Carl Alsborg, Chief, Bureau of Chemistry, Department of Agriculture; H. P. Armsby, Director of Institute of Animal Nutrition, Pennsylvania State College; Isabel Bevier, Director of Department of Home Economics, University of Illinois; E. B. Forbes, Chief, Department of Nutrition, Ohio Agricultural Experiment Station; W. H. Jordan, Director, New York Agricultural Experiment Station; Graham Lusk, Professor of Physiology, Cornell University Medical College; C. F. Langworthy, Chief of Office of Home Economics, Department of Agriculture; E. V. McCollum, Professor of Biochemistry, School of Public Health and Hygiene, Johns Hopkins University; L. B. Mendel, Professor of Physiological Chemistry, Yale University; J. R. Murlin, Professor of Physiology and Director of Department of Vital Economics, University of Rochester; R. A. Pearson, President of Iowa State Agricultural College; H. C. Sherman, Professor of Food Chemistry, Columbia University; A. E. Taylor, Rush Professor of Physiological Chemistry, University of Pennsylvania; and A. F. Woods, Botanist, President of Maryland State College of Agriculture.

This committee will devote its attention and activities to the solution of important problems connected with the nutritional values and most effective grouping and preparation of foods, both for human and animal use. Special attention will be given to national food conditions and to comprehensive problems involving the coördinated services of numerous investigators and laboratories.

The committee, with the support of the Council, is arranging to obtain funds for the support of its researches, and will get under way, just as soon as possible, certain specific investi-

gations already formulated by individual committee members and sub-committees. These include studies of the comparative food values of meat and milk and of the conditions of production of these foods in the United States, together with the whole problem of animal nutrition; the food conditions in hospitals, asylums, and similar institutions; the nutritional standards of infancy and adolescence; the formation of a national institute of nutrition; and other problems of similarly large and nationally important character.

**SMALLPOX IN TORONTO.**—An extensive outbreak of smallpox, light in form, has developed in Toronto. On November 21 there had been reported 539 cases under treatment, with no deaths.

**APPOINTMENT OF DR. J. GRAHAM.**—Dr. J. Graham has been appointed professor of anatomy at the Anderson College of Medicine, Glasgow, to succeed the late Dr. A. M. Buchanan.

**HONOR FOR DR. MARTIN.**—The Order of Commander of Saint Michael and St. George has been conferred recently upon Dr. Franklin H. Martin of Chicago by the Prince of Wales.

**APPOINTMENT OF COLONEL RUSSELL.**—Colonel Frederick F. Russell, of the Medical Corps of the Army, has been appointed official representative of the medical department of the Army in the government division of the National Research Council.

**DRUGS AND CHEMICALS.**—The following report on drugs and chemicals was issued on November 28:

"There is a shortage of many botanicals, but imports are increasing. Denatured alcohol, camphor, musk, thymol and buchu have advanced. Bitter almonds, golden seal, mercury, pepper, guaiacol carbonate and quinine are lower.

"Stocks of essential oils are so far below normal that the steady upward movement of prices continues. There is an active inquiry, but buyers are conservative and purchase in small lots. There were further advances in oil of cloves, lavender flowers, orange and Japanese mint oil. Menthol, thymol and vanillin are higher.

"Coal-tar intermediates are in good demand, and producers are refusing business for export, owing to the difficulty of filling domestic orders. Benzol is in strong request, but supplies are held by the producers. Naphthalene flakes are tending upward. Albumen is weaker.

"Stocks of fatty oil are small, but there is little demand except by a few large consumers. The export trade is at a standstill, owing to the fall in the rate of exchange with European countries. Prices remain practically unchanged, except for linseed oil, which advanced five cents.

"Sulphate of ammonia is higher and there has been considerable speculation in this product by second hands. Alums are firm. Ammonium muriate is scarce. Potash salts are in meagre supply. Sodium salts are firm. All industrials are in good demand."

#### BOSTON AND MASSACHUSETTS.

**WEEK'S DEATH RATE IN BOSTON.**—During the week ending Dec. 6, 1919, the number of deaths reported was 187 against 254 last year, with a rate of 12.24 against 16.89 last year. There were 34 deaths under one year of age against 37 last year.

The number of cases of principal reportable diseases were: Diphtheria, 68; scarlet fever, 69; measles, 154; whooping cough, 69; typhoid fever, 1; tuberculosis, 52.

Included in the above were the following cases of non-residents: Diphtheria, 15; scarlet fever, 11; measles, 2; tuberculosis, 8.

Total deaths from these diseases were: Diphtheria, 6; measles, 3; whooping cough, 5; typhoid fever, 1; tuberculosis, 12.

Included in the above were the following non-residents: Diphtheria, 3; tuberculosis, 2.

Influenza cases, 11. Last year: Influenza cases, 255; influenza deaths, 36.

**GIFT TO THE MASSACHUSETTS GENERAL HOSPITAL.**—The will of the late Philip Leverett Saltonstall of Milton provided for the gift of five thousand dollars to the Massachusetts General Hospital, for the purpose of establishing a general fund for the social service work of the hospital. The fund will be known as the Mary Elizabeth Saltonstall Fund, only the income of which is to be used for general purposes of the social service, preference being given to the health and care of little children.

**SOMERVILLE MEDICAL SOCIETY.**—At a recent meeting of the Somerville Medical Society, the following officers were elected: Dr. M. W. White, president; Dr. George C. Mahoney, vice-president; Dr. Edmund H. Robbins, secretary-treasurer. Dr. White, a native of Weymouth, has been practising in Somerville for the past twenty years, and is a member of the Somerville Hospital medical staff. He is a graduate of the Harvard Medical School.

**ELECTION OF BOSTON DISPENSARY OFFICERS.**—At the one hundred and twenty-third annual meeting of the Boston Dispensary, the following officers were elected: James Jackson, president; William Power Blodget, Ashton L. Carr, Charles M. Davenport, Mrs. Hilbert F. Day, Albert Greene Duncan, Miss Ellen F. Emerson, George A. Flynn, Mrs. Waldo E. Forbes, Edwin Farnham Greene, James Jackson, John R. Macomber, Robert W. Maynard, Frank W. Remick, Dr. Edward C. Stroeter, Edward R. Warren, Stuart W. Webb, and Charles F. Weed, board of managers.

**HEALTH CLINIC AT THE BOSTON DISPENSARY.**—At the Boston Dispensary, a health clinic has been organized and is directed by Dr. Leslie L. Spooner. It will be open on Monday, Wednesday, and Friday evenings for examinations, and advice will be given to men and women who cannot afford to pay for the private services of specialists or consultants. A fee of five dollars is charged to cover the cost.

**PUBLIC BEQUESTS.**—The will of Caroline S. Freeman of Weston included the following bequests to medical institutions: \$25,000 to the Boston Lying-In Hospital; \$10,000 each to the Children's Hospital in Boston and the Convalescent Home connected with the Children's Hospital, and \$5,000 to the Baldwinville Cottage Hospital for Children. One-fourth of a trust fund of \$175,000 will be used by the Harvard Medical School at the death of relatives.

**BRITISH APPRECIATION OF THE HARVARD MEDICAL UNIT.**—In a communication received recently by Harvard University, King George of England has expressed in the following words his personal appreciation of the services of the Harvard Medical Unit during its three years and a half of duty with the British forces in France:

"The King desires to express his warm ap-

preciation of the invaluable services rendered to the British Army by the Harvard University Hospital Unit, whose work for the sick and wounded, from the arrival of the earliest contingent of medical officers and nursing sisters before the first year of the war was ended until the conclusion of hostilities, was marked by the highest devotion and by the perfection of medical and nursing skill. Their record can never be forgotten, or remembered without lively gratitude by the British Army and the English Nation."

The Harvard Unit was organized in the spring of 1915, and in June of that year, thirty-two surgeons and physicians, three dentists, and seventy-five nurses, in charge of Dr. Edward H. Nichols, sailed for England. The Unit was assigned to General Hospital No. 22, B. E. F., and remained in service, except for a break of three weeks in 1915, until the conclusion of hostilities. After several physicians had served as directors of the Unit, Dr. Hugh Cabot was placed in permanent charge and made commanding officer of the hospital by the British Army, with the rank of lieutenant-colonel. The organization took care of over one hundred and fifty thousand casualties; at one time during the German offensive in March, 1918, Dr. Cabot and his associates took in over twelve hundred patients in twenty-four hours and had three thousand in the hospital at one time.

In a letter to President Lowell of Harvard University, Arthur J. Balfour, British foreign secretary, is reported to have said:

"They have added lustre even to the fame of Harvard. The memory of so much service and self-sacrifice can never pass from us. It will be cherished in perpetuity by the relatives and friends of those whom the Harvard Unit has tended with much admirable devotion."

**TUBERCULOSIS IN BOSTON.**—At the sixteenth annual meeting of the Boston Association for the Relief and Control of Tuberculosis, held on November 20, it was stated that during the past year there were more than twenty-seven thousand cases of tuberculosis in Boston. More than twelve thousand of these were active cases, and 1,367 persons died of that disease.

At this meeting, it was voted to change the name of the organization to the Boston Tuberculosis Association. Dr. George S. C. Badger

was elected president for the ensuing year. George D. Porter, M.B., Secretary of the Canadian Association for the Prevention of Tuberculosis, delivered an address on "Modern Educational Methods in Health Work," and "Some of the Results of the Work at the Boston Consumptives' Hospital" was the subject discussed by Frank H. Hunt, M.D.

**SERVICES OF DR. HENRY P. WALCOTT.**—To Dr. Henry P. Walcott, retiring chairman of the metropolitan water and sewerage commission, Governor Coolidge is reported to have expressed on behalf of the State the following words of appreciation for his services:

"I feel that you are entitled to the thanks of this Commonwealth for the almost two generations that you have served the public as a health officer and as guardian of the metropolitan water supply. If the public health is good and the sanitary laws wise, to you belongs the credit. You are especially to be commended for the splendid water system that supplies so many hundreds of thousands of your fellow-citizens.

"I trust that, released from the exacting duties, you will have an opportunity of realizing, as the rest of us do, the magnitude of the service which you have performed and the blessings that have come to Massachusetts because you have been in her service."

**HONOR FOR DR. WASHBURN.**—Dr. Frederic A. Washburn, superintendent of the Massachusetts General Hospital, has been decorated by the Prince of Wales with the Order of St. Michael and St. George. During the war, Dr. Washburn was chief surgeon of Base Hospital No. 5.

**RETURNED TO CIVILIAN PRACTICE.**—Dr. Frederick T. Clark, of Westfield, Chief of the ophthalmological and oto-rhinolaryngological services of the United States Army General Hospital No. 1, has been discharged from service.

arrange with well known specialists in various medical fields to give talks at meetings of the District Medical Societies on subjects of interest and importance to all practitioners. It is a pleasure to announce that a similar arrangement has been made this year, and that the gentlemen named below are willing, without expense to the District Society, to give occasional talks of thirty or forty minutes on subjects relating to the promotion of public health, and extend opportunity for questions and discussion.

Dr. Edwin H. Place, Physician-in-Chief, South Department, Boston City Hospital, Specialty, contagious diseases.

Dr. George H. Wright, Lecturer on Dental Hygiene, Harvard Dental School. Specialty, dental surgery.

Dr. William T. Sedgwick, Department of Biology and Public Health, Massachusetts Institute of Technology.

Dr. C. Morton Smith, Chief of Department of Syphilis, Massachusetts General Hospital.

Dr. William Woodward, Health Commissioner, Boston.

Dr. Walter Fernald, Superintendent, Massachusetts School for Feeble-minded.

Dr. Frank Dunbar, Bacteriologist, Instructor in Bacteriology and Pathology, Tufts College Medical School.

Dr. Timothy Leary, Professor of Pathology, Tufts College Medical School, Medical Examiner, Suffolk County.

Dr. Victor Safford, Boston Health Department.

Dr. Howard A. Streeter, Director, Sub-division of Venereal Diseases, Massachusetts Department of Health.

Secretaries of District Societies desiring to arrange for speakers from this list should communicate with the Secretary of the Committee, Dr. Annie Lee Hamilton, 141 Newbury Street, Boston, Mass.

### The Massachusetts Medical Society.

#### TO THE SECRETARIES OF THE DISTRICT MEDICAL SOCIETIES.

The Public Health Committee of the Massachusetts Medical Society was able last year to

#### NEWS FROM DISTRICT SOCIETIES.

The Hampshire District Medical Society held a large and enthusiastic meeting at Forbes Library, Northampton, on December 4. A special committee, appointed to revise the fee table, submitted a report which was unanimously adopted.



It was voted to resume meetings bi-monthly instead of quarterly, made necessary on account of the absence of several members in the U. S. service during the war.

Dr. Alfred Worcester, president of the State Society, was present and discussed various measures appertaining to state and national health legislation and urged the coöperation of members in maintaining and securing adequate safeguards to public health.

Dr. Joel E. Goldthwait of Boston spoke on "Some of the Lessons Learned as a Result of the War Activities Which Should be of Value to the General Practitioner." He described the coördination of treatment at the front, and particularly the work of reconstructing recruits who were below the Army standards as regards postural defects and careless carriage. The success following a few months' intensive training in setting-up exercises warranted a continuance of measures for hygienic development in peace times, beginning with the growing child in order to prevent static deformities in later life. The speaker exhibited tracings of various adult types.

E. E. THOMAS, *Secretary*.

### Obituary.

#### CHARLES HENRY COOK, M.D.

CHARLES H. COOK, a Councilor of the Massachusetts Medical Society for eight years and a member of the Board of Registration in Medicine for ten years, died at his home in Natick, December 3, 1919, aged seventy-four years.

Dr. Cook was born in Greensboro, Vermont April 10, 1845; he graduated from Dartmouth College in the class of 1869 and took his M.D. at Bellevue Hospital Medical College, New York, in 1874. The next year he settled in Natick, Mass., and passed the rest of his life there in general practice. He married Miss Rosa F. Perkins of Barre, Vt., who died about nine years ago. Appointed to the Massachusetts Board of Registration in Medicine in 1909, Dr. Cook took an active interest in the question of registration from that time; he was a constant attendant at the annual meetings of the Federation of Medical Examining Boards of the United States and acted as president in the years 1915 and 1916. He was a frequent speaker on the floor of the Council of the Mas-

sachusetts Medical Society and always spent much of his time in furthering the advancement of the standards governing medical practice. He had a liberal outlook and was fair and judicious in his dealings with men.

Dr. Cook was a trustee of the Leonard Morse Hospital, a member of its building committee, continuing on the Board until a month before his death. He served on the prudential committee of the Congregational Church in Natick and was active in public questions affecting the town. A kindly spirit and a courteous manner endeared him to many, especially to the younger members of the medical profession.

The Board of Registration in Medicine, having learned that Dr. Charles H. Cook of Natick, Mass., died at his home on the third day of December, 1919, hereby records its regret at this removal from the duties of earthly life of an honored and esteemed member.

Dr. Cook brought to the service of the State a mature mind trained in medicine, and in the performance of civic duties. He was deeply interested in all matters relating to the elevation of standards governing medical practice, but was liberal and judicious in his attitude toward those whose opinions did not conform to his conception of the best methods to be employed. As a member of this Board, he was industrious, punctual and fair-minded. In dealing with applicants for registration, or offenders against the law of the ethics of medical practice, he carefully weighed all evidence submitted and arrived at conclusions after careful analysis of all facts and statements submitted.

His nature was unusually free from many of the weaknesses of humanity and his character was unblemished.

By the death of Dr. Cook this Board has lost a useful member and the State a faithful servant.

By unanimous vote this Board places this testimonial upon its records, and the Secretary is hereby instructed to forward a copy to the relatives of Dr. Cook and to the BOSTON MEDICAL AND SURGICAL JOURNAL.

### Correspondence.

SCARLET FEVER WAVES.

West Newton, Mass., Dec. 9, 1919.

Mr. Editor:

Dr. Osborn's timely article in the JOURNAL of December 4, on "The Wave of Scarlet Fever in 1919," has tempted me to record some of our experiences with the wave in Newton, in the hope that other

health officers may do the same, thus adding to the general information in regard to scarlet fever.

It became evident early in October that the reported cases of scarlet fever were increasing greatly and this increase has continued steadily to date. In Newton our monthly average of reported cases for five years ending in 1918 has been: September, 2; October, 4; November, 5; and December, 6; while for 1919 the figures are: September, 4; October, 18; November, 23; and to December 7, 19.

One of the most striking facts in connection with the wave is the large number of missed cases which have been found. In addition to the reported cases, we have found to date 12 other cases in which the evidence is conclusive that they have had scarlet fever, and five others in which the evidence, while less conclusive, is still enough to warrant a strong presumption that they have had it.

The mildness of the disease is largely responsible for these missed cases, for either a physician was not called to see the case at all or else when he was called he was deceived by the mildness of the symptoms and failed to recognize the disease.

Many of the cases were very difficult of recognition, the temperature being only slightly elevated, vomiting often not present, the throat not characteristic and the rash very fleeting. Often when the physician saw the case there was little or nothing to suggest scarlet fever, but later the characteristic throat and tongue developed and scarlatinal desquamation followed in due course.

Many of the missed cases attended school during the greater part of the course of the disease. This was especially true during the early part of the outbreak and was due to the fact that, because of the mildness of the symptoms, the children were not absent at all and it was not until desquamation or some other cause drew attention to them that they were discovered.

In spite of the fact that many of these missed cases attended school steadily, in some instances as long as two or even three weeks before discovery, they did not cause other cases among the children who sat next to them in school, but did often cause other cases among their playmates out of school.

This was very noticeable in one instance in which a missed case was responsible for five other cases, not one of whom attended the school in which he was a pupil. This boy attended school for three weeks before he was discovered and there were no cases in the same room with him either before or for two weeks after his removal. He did, however, infect two of his brothers, his sister-in-law and two of her children and was discovered through tracing the infection in one of these cases.

As the outbreak continued we noticed that with the increase in the number of admissions and consequent crowding of the wards, there was a corresponding increase in the number of secondary infections, such as ears, glands, noses, and fingers. This was so marked that at one time 33.3% of the patients had suppurating ears, glands or fingers. These complications developed, as a rule, at the end of the second or beginning of the third week after admission, but is not peculiar to this outbreak, having been observed every time the scarlet fever wards have been over-crowded. They also increased the average hospital stay.

What are the practical conclusions to be drawn from this outbreak which may be of use to us as health officers in combating future ones?

One of the first is that physicians should be urged to be very cautious about deciding that a child who shows nothing but a red throat and a little temperature has not atypical scarlet fever. Time after time we found cases of this sort in which careful questioning of the mother and the child disclosed the fact that two or three days previous to the visit, he had vomited, had fever, and showed a fleeting rash.

The child's testimony is often of value. In one instance, in which the mother denied everything, the

child suddenly volunteered the information that he had vomited. With this as a start, it was easy to discover that there had been vomiting and fever, followed by a rash which lasted about 12 hours. The diagnosis was subsequently confirmed by the development of the characteristic tongue and by desquamation.

In all cases of doubt the health department should be asked to see the case, not because the health officer can necessarily make a better diagnosis, but because he is more alive to the danger from missed cases and, because of his official position, can impose a temporary isolation more easily than the physician and relieve the latter from possible criticism. Parents will often accept without question a statement from the health officer that he does not know what the disease is but must isolate the child for a day or two pending developments, when they would look askance at the doctor who said the same thing.

The necessity of a more careful inspection of school children was very evident. Many of the missed cases escaped discovery because they attracted no attention; they had not been absent and were not sick and so were not examined. Later, when the increase in reported cases caused a tightening of the inspection, fewer cases were overlooked.

One of the first necessities is careful supervision of children returned after absence, however short. No child should be allowed to re-enter the class room, after absence, until he has passed before the physician or nurse and has been inspected and questioned as to the reason of his absence and as to sickness in other members of the family.

In all cases of doubt children must be sent home and their names and addresses telephoned at once to the health department for investigation.

A list of all absentees who have been out for 48 hours should be given to the nurses for investigation and report. If illness is found in the family, a report must be sent at once to the health department.

The best method of controlling the suppurative cases is, of course, the segregation of the older cases from the newer ones. Whether this should be accomplished by removing the older cases, which are clean, to a separate building about the end of the second week, or, in some less efficient manner, must depend entirely on local conditions.

It would seem to indicate that a possible change of plan in future isolation hospitals would be advisable and that the cubicle plan with small wards of three or four beds each is the most efficient.

This might possibly increase the per capita cost, but would, in the end, be more economical as it would undoubtedly reduce the average length of stay.

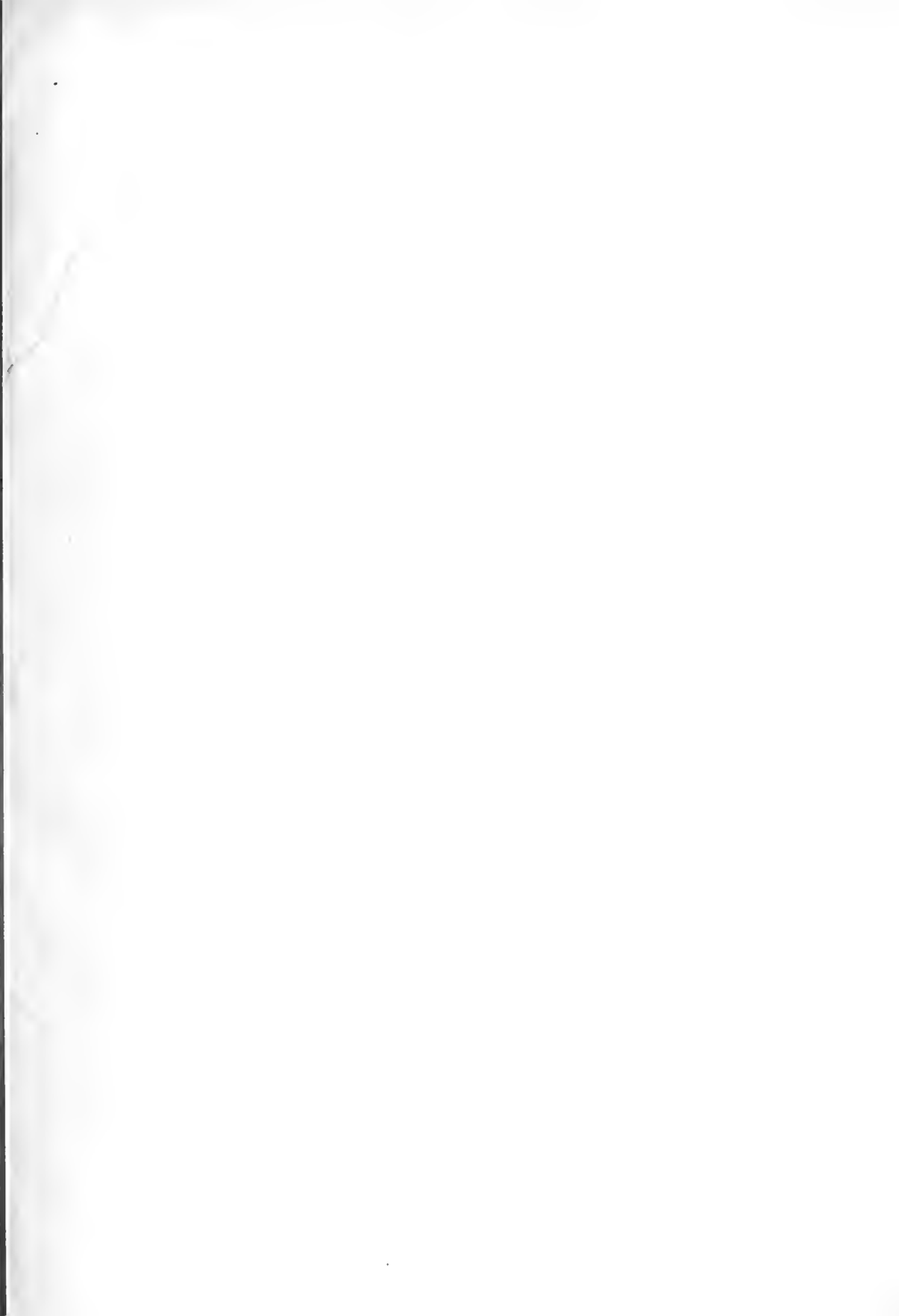
FRANCIS GEO. CRETIS, M.D.,

*Chairman, Newton Board of Health.*

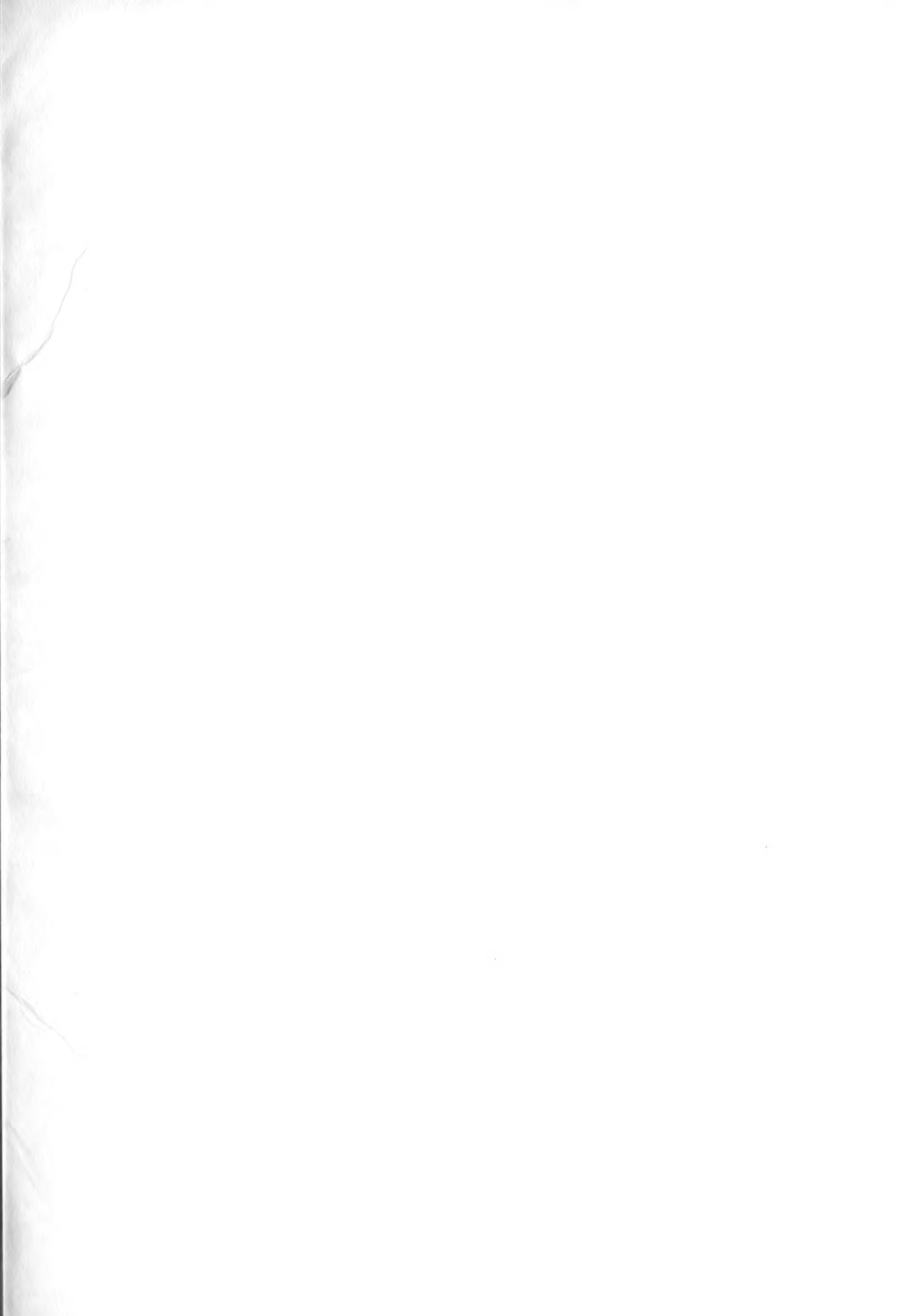
## RECENT DEATHS.

DR. GEORGE EDWIN ADAMS died at his home in Worcester on November 29, at the age of 61 years. He was born in Lawrence and received his early education in the Lowell public schools. He was graduated from the Harvard Medical School in 1880 and began practicing in Worcester in 1882. Dr. Adams was a Fellow of the Massachusetts Medical Society and of the Worcester District Medical Society. He was senior examiner for the Prudential Life Insurance Company. Dr. Adams is survived by two children.

DR. EDWARD C. WALL of Woburn died suddenly of heart failure recently. Dr. Wall was born in Wilmington 25 years ago. He attended Boston College and was graduated from Georgetown Dental School last spring. He is survived by his parents and one brother.









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